FUJITSU

FUJITSU Server
PRIMEQUEST 1000 Series
Administration Manual

C122-E108-10EN

Preface

This manual describes how to use tools and software for system administration of the PRIMEQUEST 1000 series system and how to maintain the system (component replacement and error notification). The manual is intended for system administrators.
For details on the regulatory compliance statements and safety precautions, see the *PRIMEQUEST 1000 Series Safety and Regulatory Information* (C122-E115XA).

Errata and addenda for the manual
The *PRIMEQUEST 1000 Series Errata and Addenda* (C122-E119EN) provides errata and addenda for the manual.
Read the *PRIMEQUEST 1000 Series Errata and Addenda* (C122-E119EN) thoroughly in reference to the manual.

For Safe Operation

How to use this manual

This manual contains important information about the safe use of this product. Read the manual thoroughly to understand the information in it before using this product. Be sure to keep this manual in a safe and convenient location for quick reference.
Fujitsu makes every effort to prevent users and bystanders from being injured and to prevent property damage. Be sure to use the product according to the instructions in the manual.

About this product

This product is designed and manufactured for standard applications. Such applications include, but are not limited to, general office work, personal and home use, and general industrial use. The product is not intended for applications that require extremely high levels of safety to be guaranteed (referred to below as "safety-critical" applications). Use of the product for a safety-critical application may present a significant risk of personal injury and/or death. Such applications include, but are not limited to, nuclear reactor control, aircraft flight control, air traffic control, mass transit control, medical life support, and missile launch control. Customers shall not use the product for a safety-critical application without guaranteeing the required level of safety. Customers who plan to use the product in a safety-critical system are requested to consult the Fujitsu sales representatives in charge.

Storage of accessories

Keep the accessories in a safe place because they are required for server operation.

Organization and Notation of This Manual

This section describes the following topics:

- Organization of this manual
- Manuals for the PRIMEQUEST 1000 series
- Related manuals
- Abbreviations
- Notation
- Notation for the CLI (command line interface)
- Notes on notations
- Alert messages

- Product operating environment
- Trademarks

Organization of this manual

This manual is organized as follows.

CHAPTER 1 Network Environment Setup and Tool Installation

Chapter 1 describes the external network environment and management tool installation for the PRIMEQUEST 1000 series.

CHAPTER 2 Operating System Installation (Link)

Chapter 2 provides a link to Chapter 4 Installing the Operating System and Bundled Software in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

CHAPTER 3 Component Configuration and Replacement (Addition and Removal)

Chapter 3 describes the component configuration and how to replace, add, and remove components for the PRIMEQUEST 1000 series.

CHAPTER 4 Hot Replacement of Hard Disks

Chapter 4 describes hot replacement of hard disks.

CHAPTER 5 PCI Card Hot Maintenance in Red Hat Enterprise Linux 5

Chapter 5 describes hot maintenance of PCI cards in Red Hat Enterprise Linux.

CHAPTER 6 PCI Card Hot Maintenance in Red Hat Enterprise Linux 6

Chapter 6 describes the methods of PCI card replacement with the PCI Hot Plug function.

CHAPTER 7 PCI Card Hot Maintenance in Windows

Chapter 7 describes the hot plugging procedure for PCI cards in Windows.

CHAPTER 8 Backup and Restore

Chapter 8 describes the backup and restore operations required for restoring server data.

CHAPTER 9 System Startup, Shutdown, and Power Control

Chapter 9 describes how to start and shut down the system, and control the system power.

CHAPTER 10 Configuration and Status Checking (Contents, Methods, and Procedures)

Chapter 10 describes functions for checking the configuration and status of the PRIMEQUEST 1000 series server. The functions are broken down by firmware (or other software) and by tool.

CHAPTER 11 Error Notification and Maintenance (Contents, Methods, and Procedures)

Chapter 11 describes the maintenance functions provided by the PRIMEQUEST 1000 series. It also describes actions to take for any problems that occur.

APPENDIX A Functions Provided by the PRIMEQUEST 1000 Series

Appendix A lists the functions provided by the PRIMEQUEST 1000 series.

APPENDIX B Physical Mounting Locations and Port Numbers

Appendix B describes the physical mounting locations of components, and shows GSPB and MMB port numbering.

APPENDIX C Lists of External Interfaces

Appendix C describes the external interfaces of the PRIMEQUEST 1000 series.

APPENDIX D Physical Locations and BUS Numbers of Built-in I/O, and PCI Slot Mounting Locations and Slot Numbers

Appendix D shows the correspondence between the physical locations and BUS numbers of built-in I/O in the PRIMEQUEST 1000 series server. It also shows the correspondence between PCI slot mounting locations and slot numbers.

APPENDIX E PRIMEQUEST 1000 Series Cabinets (Link)

Appendix E provides a link to Chapter 1 Installation Information in the *PRIMEQUEST 1000 Series Hardware Installation Manual* (C122-H004EN).

APPENDIX F Status Checks with LEDs

Appendix F describes the types of mounted LEDs for the PRIMEQUEST 1000 series. It also describes how to check the status with the LEDs.

APPENDIX G Component Mounting Conditions

Appendix G describes the mounting conditions of components for the PRIMEQUEST 1000 series.

APPENDIX H Tree Structure of the MIB Provided with the PRIMEQUEST 1000 Series

Appendix H describes the tree structure of the MIB provided with the PRIMEQUEST 1000 series.

APPENDIX I Windows Shutdown Settings

Appendix I describes how to set Windows to shut down, and some precautions about the settings.

APPENDIX J Systemwalker Centric Manager Linkage

Appendix J describes linkage with Systemwalker Centric Manager.

APPENDIX K How to Confirm Firmware of SAS Array Controller Card

Appendix K describes how to confirm the firmware of SAS array controller card (including the one contained in the SAS array disk unit).

APPENDIX L Software (Link)

Appendix L provides a link to Chapter 3 Software Configuration in the *PRIMEQUEST 1000 Series General Description* (C122-B022EN).

APPENDIX M Failure Report Sheet

Appendix M provides the failure report sheet. Use the sheet when any failure occurs.

Index

The index lists keywords and the pages that they refer to, helping readers quickly find the necessary information in the manual.

Manuals for the PRIMEQUEST 1000 series

The following manuals have been prepared to provide you with the information necessary to use the PRIMEQUEST 1000 series.

You can access HTML versions of these manuals at the following sites:

Japanese-language site: http://jp.fujitsu.com/platform/server/primequest/manual/

Global site: http://jp.fujitsu.com/platform/server/primequest/manual-e/

Title	Description	Manual code
PRIMEQUEST 1000 Series Getting Started Guide	Describes what manuals you should read and how to access important information after unpacking the	C122-E114XA

Title	Description	Manual code
	PRIMEQUEST 1000 series server. (This manual comes with the product.)	
PRIMEQUEST 1000 Series Safety and Regulatory Information	Contains important information required for using the PRIMEQUEST 1000 series safely.	C122-E115XA
PRIMEQUEST 1000 Series Errata and Addenda	Provides errata and addenda for the PRIMEQUEST 1000 series manuals. This manual will be updated as needed.	C122-E119EN
PRIMEQUEST 1000 Series General Description	Describes the functions and features of the PRIMEQUEST 1000 series.	C122-B022EN
Fujitsu M10/SPARC M10 Systems/SPARC Enterprise/ PRIMEQUEST Common Installation Planning Manual	Provides the necessary information and concepts you should understand for installation and facility planning for SPARC M10 Systems, SPARC Enterprise, and PRIMEQUEST installations.	C120-H007EN
PRIMEQUEST 1000 Series Hardware Installation Manual	Includes the specifications of and the installation location requirements for the PRIMEQUEST 1000 series.	C122-H004EN
PRIMEQUEST 1000 Series Installation Manual	Describes how to set up the PRIMEQUEST 1000 series server, including the steps for installation preparation, initialization, and software installation.	C122-E107EN
PRIMEQUEST 1000 Series User Interface Operating Instructions	Describes how to use the Web-UI and UEFI to assure proper operation of the PRIMEQUEST 1000 series server.	C122-E109EN
PRIMEQUEST 1000 Series Administration Manual	Describes how to use tools and software for system administration and how to maintain the system (component replacement and error notification).	C122-E108EN
PRIMEQUEST 1000 Series Tool Reference	Provides information on operation methods and settings, including details on the MMB, PSA, and UEFI functions.	C122-E110EN
PRIMEQUEST 1000 Series Message Reference	Lists the messages that may be displayed when a problem occurs during operation and describes how to respond to them.	C122-E111EN
PRIMEQUEST 1000 Series REMCS Installation Manual	Describes REMCS service installation and operation.	C122-E120EN
PRIMEQUEST 1000 Series Glossary	Defines the PRIMEQUEST 1000 series related terms and abbreviations.	C122-E116EN
PRIMEQUEST 1000 Series SAN Boot Environment Configuration Manual	Gives a revised version of APPENDIX D Configuring the SAN Boot Environment in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN). This	C122-E155EN

Title	Description	Manual code
	manual describes procedures for installing the SAN boot environment and provides the latest information including notes on design.	

Related manuals

The following manuals relate to the PRIMEQUEST 1000 series.

You can access these manuals at the following site:

http://jp.fujitsu.com/platform/server/primequest/manual-e/

Contact your sales representative for inquiries about the ServerView manuals.

Title	Description	Manual code
ServerView Suite ServerView Operations Manager Quick Installation (Windows)	Describes how to install and start ServerView Operations Manager in a Windows environment.	None
ServerView Suite ServerView Operations Manager Quick Installation (Linux)	Describes how to install and start ServerView Operations Manager in a Linux environment.	None
ServerView Suite ServerView Installation Manager	Describes the installation procedure using ServerView Installation Manager.	None
ServerView Suite ServerView Operations Manager Server Management	Provides an overview of server monitoring using ServerView Operations Manager, and describes the user interface of ServerView Operations Manager.	None
ServerView Suite ServerView RAID Management User Manual	Describes RAID management using ServerView RAID Manager.	None
ServerView Suite Basic Concepts	Describes the basic concepts of ServerView Suite.	None
ServerView Operations Manager Installation ServerView Agents for Linux	Describes installation and update installation of ServerView Linux Agent.	None
ServerView Operations Manager Installation ServerView Agents for Windows	Describes installation and update installation of ServerView Windows Agent.	None

Title	Description	Manual code
ServerView Mission Critical Option User Manual	Describes the necessary functions unique to PRIMEQUEST (notification via the MMB, hot replacement command) and ServerView Mission Critical Option (SVmco), which is required for supporting these functions. Also includes explanation of ServerView Mission Critical Option for VM (SVmcovm) required for VMware vSphere 5 server monitor.	None
ServerView RAID Manager VMware vSphere ESXi 5 Installation Guide	Describes the installation and settings required to use ServerView RAID Manager on the VMware vSphere ESXi 5 server.	None
MegaRAID SAS Software	Provides technical information on using array controllers. Refer to the manual from the SVS-DVD2 supplied with the product or from the following URL: The Fujitsu Technology Solutions manuals server http://manuals.ts.fujitsu.com/	None
MegaRAID SAS Device Driver Installation	Provides technical information on using array controllers. Refer to the manual from the SVS-DVD2 supplied with the product or from the following URL: The Fujitsu Technology Solutions manuals server http://manuals.ts.fujitsu.com/	None
Modular RAID Controller Installation Guide	Provides technical information on using array controllers. Refer to the manual from the SVS-DVD2 supplied with the product or from the following URL: The Fujitsu Technology Solutions manuals server http://manuals.ts.fujitsu.com/	None

Abbreviations

This manual uses the following product name abbreviations.

Formal product name	Abbreviation
Red Hat® Enterprise Linux® 5 (for Intel 64)	Linux RHEL5, RHEL
Red Hat® Enterprise Linux® 5 (for x86)	
Red Hat® Enterprise Linux® 6 (for Intel 64)	Linux RHEL6, RHEL
Red Hat® Enterprise Linux® 6 (for x86)	
Microsoft® Windows Server® 2003, Standard Edition	Windows Windows Server 2003

Formal product name	Abbreviation
Microsoft® Windows Server® 2003, Enterprise Edition	
Microsoft® Windows Server® 2003, Datacenter Edition	
Microsoft® Windows Server® 2003, Standard x64 Edition	
Microsoft® Windows Server® 2003, Enterprise x64 Edition	
Microsoft® Windows Server® 2003, Datacenter x64 Edition	
Microsoft® Windows Server® 2003 R2, Standard Edition	
Microsoft® Windows Server® 2003 R2, Enterprise Edition	
Microsoft® Windows Server® 2003 R2, Datacenter Edition	
Microsoft® Windows Server® 2003 R2, Standard x64 Edition	
Microsoft® Windows Server® 2003 R2, Enterprise x64 Edition	
Microsoft® Windows Server® 2003 R2, Datacenter x64 Edition	
Microsoft® Windows Server® 2008 Standard	Windows Windows Server 2008
Microsoft® Windows Server® 2008 Enterprise	
Microsoft® Windows Server® 2008 Datacenter	
Microsoft® Windows Server® 2008 R2 Standard	
Microsoft® Windows Server® 2008 R2 Enterprise	
Microsoft® Windows Server® 2008 R2 Datacenter	
Microsoft(R) Windows Server(R) 2012 Datacenter	Windows Windows Server 2012
Microsoft(R) Windows Server(R) 2012 Standard	
VMware vSphere(R) 4	vSphere 4, VMware 4
VMware vSphere(R) 5	vSphere 5, VMware 5
VMware(R) ESX(TM) 4	ESX, ESX 4.x
VMware(R) ESXi(TM) 5	ESXi, ESXi 5.x
Novell(R) SUSE(R) LINUX Enterprise Server 11 Service Pack 2	SLES11 SP2

Notation

This manual uses the following fonts and symbols to express specific types of information.

Font or symbol	Meaning	Example
italics	Title of a manual that you should refer to	See the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

Font or symbol	Meaning	Example
[ ]	Window names as well as the names of buttons, tabs, and drop-down menus in windows are enclosed in brackets.	Click the [OK] button.

Notation for the CLI (command line interface)

The following notation is used for commands.

Command syntax

Command syntax is represented as follows.

- Variables requiring the entry of a value are enclosed in angle brackets < >.
- Optional elements are enclosed in brackets [ ].
- Options for optional keywords are grouped in | (stroke) separated lists enclosed in brackets [ ].
- Options for required keywords are grouped in | (stroke) separated lists enclosed in braces { }.

Command syntax is written in a box.

Remarks

The command output shown in the PDF manuals may include line feeds at places where there is no line feed symbol (\ at the end of the line).

Notes on notations

- In this manual, the Management Board and MMB firmware are abbreviated as "MMB."
- In this manual, IOBs and GSPBs (LIOBs and LGSPBs within partitions) are collectively referred to as IO Units.
- Screenshots contained in this manual may differ from the actual product screen displays.
- The IP addresses, configuration information, and other such information contained in this manual are display examples and differ from that for actual operation.

Alert messages

This manual uses the following alert messages to prevent users and bystanders from being injured and to prevent property damage.

WARNING	This indicates a hazardous situation that is likely to result in death or serious personal injury if the user does not perform the procedure correctly.
CAUTION	This indicates a hazardous situation that could result in minor or moderate personal injury if the user does not perform the procedure correctly. This also indicates that damage to the product or other property may occur if the user does not perform the procedure correctly.
Important	This indicates information that could help the user use the product more efficiently.

Alert messages in the text

An alert statement follows an alert symbol. An alert statement is indented on both ends to distinguish it from regular text. Similarly, one space line is inserted before and after the alert statement.

Only Fujitsu certified service engineers should perform the following tasks on this product and the options provided by Fujitsu. Customers must not perform these tasks under any circumstances. Otherwise, electric shock, injury, or fire may result.

- Newly installing or moving equipment
- Removing the front, rear, and side covers
- Installing and removing built-in options
- Connecting and disconnecting external interface cables
- Maintenance (repair and periodic diagnosis and maintenance)

The List of important alert items table lists important alert items.

Product operating environment

This product is a computer intended for use in a computer room environment. For details on the product operating environment, see the following manual:
PRIMEQUEST 1000 Series Hardware Installation Manual (C122-H004EN)

Note

- If you have a comment or request regarding this manual, or if you find any part of this manual unclear, please take a moment to share it with us by filling in the form at the following webpage, stating your points specifically, and sending the form to us:
  https://www-s.fujitsu.com/global/contact/computing/PRMQST_feedback.html
- The contents of this manual may be revised without prior notice.
- The PDF file of this manual is intended for display using Adobe® Reader® in single page viewing mode at 100% zoom.
- The PRIMEQUEST 1800E2/1800E model supports only 200 V power supply.

Trademarks

- Microsoft, Windows, and Windows Server are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries.
- Linux is a registered trademark of Linus Torvalds.
- Red Hat, the Shadowman logo and JBoss are registered trademarks of Red Hat, Inc. in the U.S. and other countries.
- Intel and Xeon are trademarks or registered trademarks of Intel Corporation.
- Ethernet is a registered trademark of Fuji Xerox Co., Ltd. in Japan and is a registered trademark of Xerox Corp. in the United States and other countries.
- VMware is a trademark or registered trademark of VMware, Inc. in the United States and other countries.
- Novell and SUSE Linux Enterprise Server are trademarks of Novell, Inc.
- Xen is a trademark or registered trademark of Citrix Systems, Inc. or its subsidiaries in the United States and other countries.
- Other company names and product names are the trademarks or registered trademarks of their respective owners.
- Trademark indications are omitted for some system and product names in this manual.

Safety Precautions

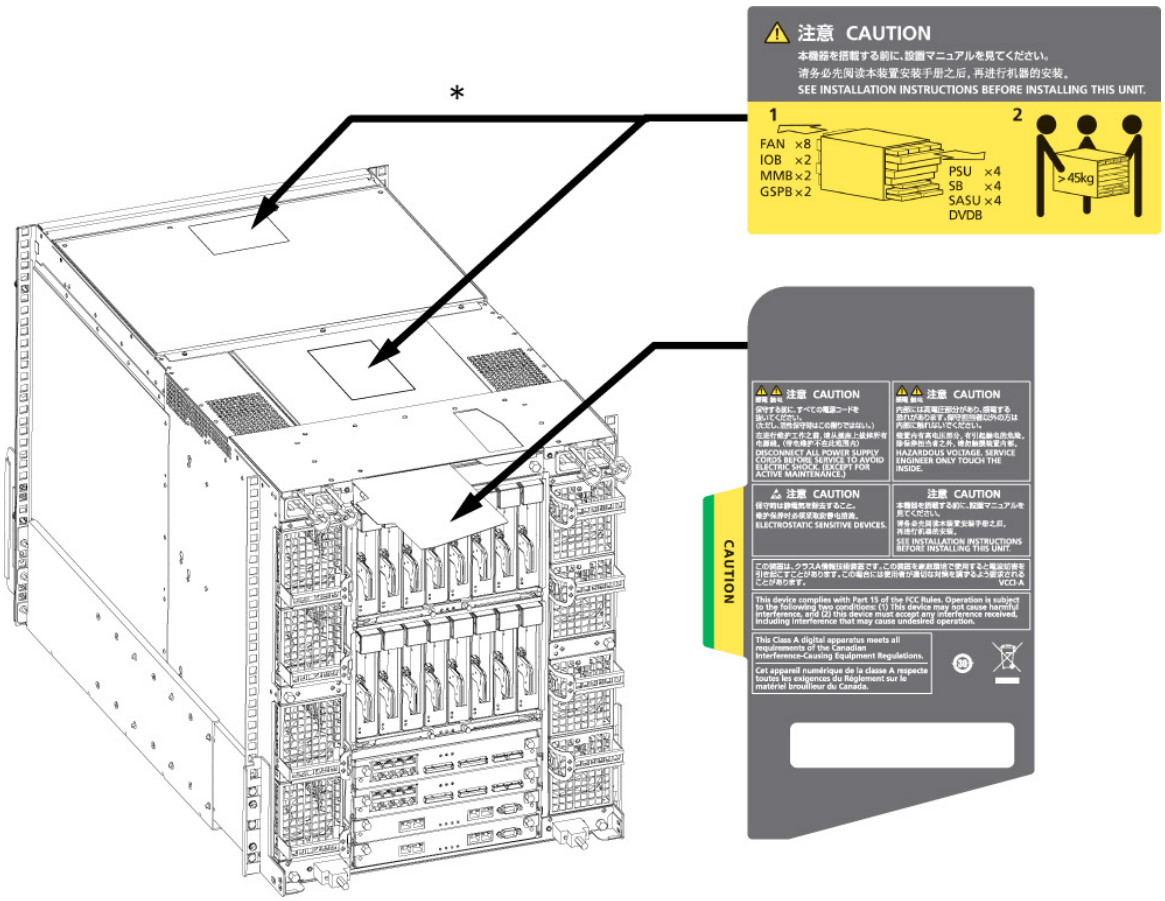
List of important alert items

This manual does not contain important alert items.

Warning labels

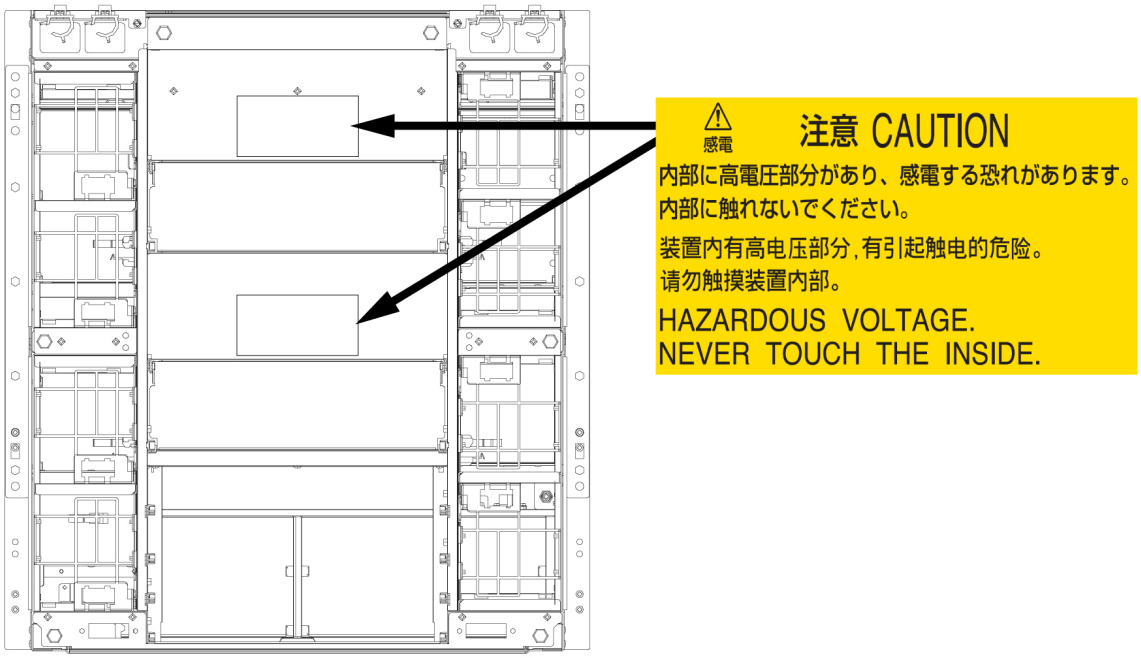
The following warning labels are affixed to this product. These labels are intended for the users of this product.

CAUTION Never remove the warning labels.

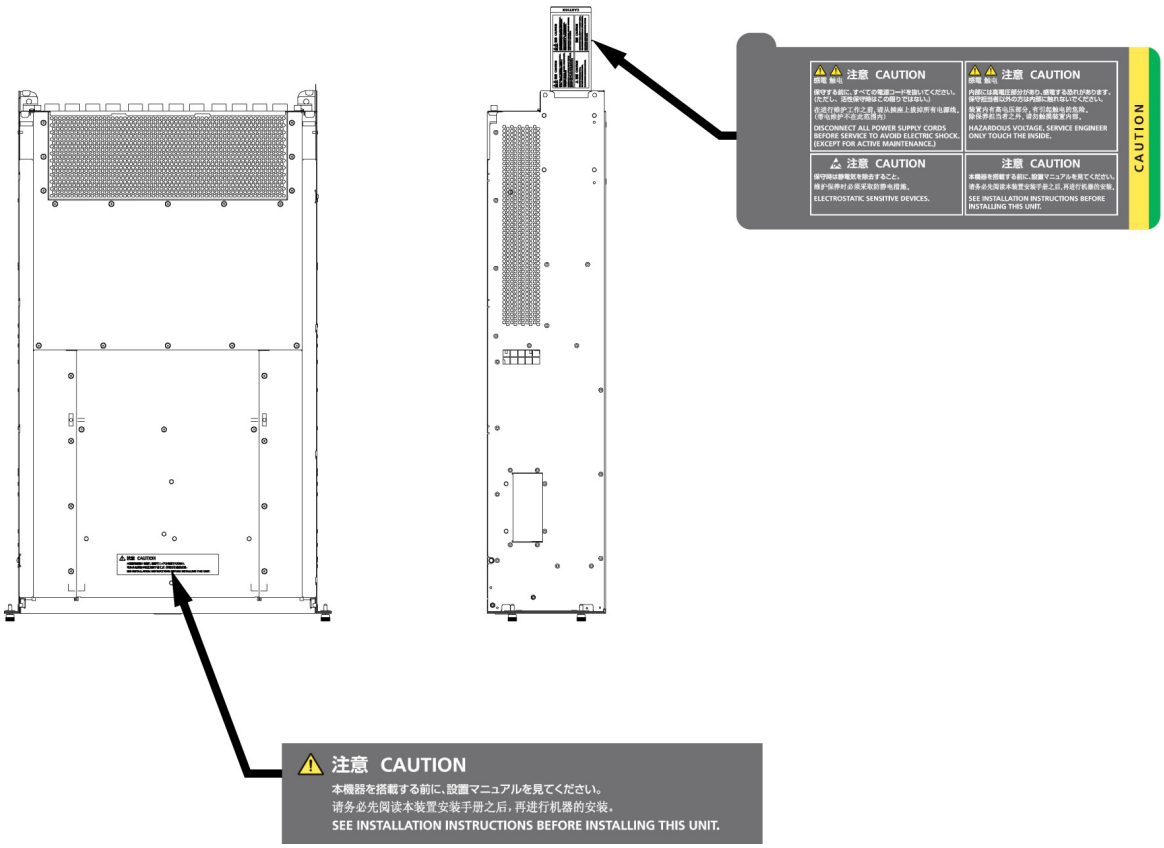

*
注意 CAUTION
本機器を搭載する前に、設置マニュアルを見てください。
请务必先阅读本装置安装手册之后，再进行机器的安装。
SEE INSTALLATION INSTRUCTIONS BEFORE INSTALLING THIS UNIT.
1
FAN ×8
IOB ×2
MMB ×2
GSPB ×2
PSU ×4
SB ×4
SASU ×4
DVDB
2
>45kg
注意 CAUTION
DISCONNECT ALL POWER SUPPLY CORDS BEFORE SERVICING TO AVOID ELECTRIC SHOCK. (EXCEPT FOR ACTIVE MAINTENANCE.)
注意 CAUTION
HAZARDOUS VOLTAGE. SERVICE ENGINEER ONLY TOUCH THE INSIDE.
注意 CAUTION
ELECTROSTATIC SENSITIVE DEVICES.
注意 CAUTION
SEE INSTALLATION INSTRUCTIONS BEFORE INSTALLING THIS UNIT.
CAUTION
VCCI-A
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

* The label is affixed at either location.

Warning label location (PRIMEQUEST 1800E2/1800E rear)



Warning label location (PRIMEQUEST 1800E2/1800E rear) (IOBs removed)


注意 CAUTION
DISCONNECT ALL POWER SUPPLY CORDS BEFORE SERVICE TO AVOID ELECTRIC SHOCK. (EXCEPT FOR ACTIVE MAINTENANCE.)
注意 CAUTION
HAZARDOUS VOLTAGE. SERVICE ENGINEER ONLY TOUCH THE INSIDE.
注意 CAUTION
ELECTROSTATIC SENSITIVE DEVICES.
注意 CAUTION
SEE INSTALLATION INSTRUCTIONS BEFORE INSTALLING THIS UNIT.
CAUTION
注意 CAUTION
本機器を搭載する前に、設置マニュアルを見てください。
请务必先阅读本装置安装手册之后，再进行机器的安装。
SEE INSTALLATION INSTRUCTIONS BEFORE INSTALLING THIS UNIT.

Warning label location (PCI_Box)

Notes on Handling the Product

Adding optional products

For stable operation of the PRIMEQUEST 1000 series server, use only a Fujitsu certified optional product as an added option.

Note that the PRIMEQUEST 1000 series server is not guaranteed to operate with any optional product not certified by Fujitsu.

Maintenance

Only Fujitsu certified service engineers should perform the following tasks on this product and the options provided by Fujitsu. Customers must not perform these tasks under any circumstances. Otherwise, electric shock, injury, or fire may result.

- Newly installing or moving equipment
- Removing the front, rear, and side covers
- Installing and removing built-in options
- Connecting and disconnecting external interface cables
- Maintenance (repair and periodic diagnosis and maintenance)

Only Fujitsu certified service engineers should perform the following tasks on this product and the options provided by Fujitsu. Customers must not perform these tasks under any circumstances. Otherwise, product failure may result.

- Unpacking an optional Fujitsu product, such as an optional adapter, delivered to the customer

Modifying or recycling the product

Modifying this product or recycling a secondhand product by overhauling it without prior approval may result in personal injury to users and/or bystanders or damage to the product and/or other property.

Note on erasing data from hard disks when disposing of the product or transferring it

Disposing of this product or transferring it as is may enable third parties to access the data on the hard disk and use it for unforeseen purposes. To prevent the leakage of confidential information and important data, all of the data on the hard disk must be erased before disposal or transfer of the product.

However, it can be difficult to completely erase all of the data from the hard disk. Simply initializing (reformatting) the hard disk or deleting files on the operating system is insufficient to erase the data, even though the data appears at a glance to have been erased. This type of operation only makes it impossible to access the data from the operating system. Malicious third parties can restore this data.

If you save your confidential information or other important data on the hard disk, you should completely erase the data, instead of simply carrying out the aforementioned operation, to prevent the data from being restored.

To prevent important data on the hard disk from being leaked when the product is disposed of or transferred, you will need to take care to erase all the data recorded on the hard disk on your own responsibility.
Furthermore, if a software license agreement restricts the transfer of the software (operating system and application software) on the hard disk in the server or other product to a third party, transferring the product without deleting the software from the hard disk may violate the agreement. Adequate verification from this point of view is also necessary.

Support and service

SupportDesk (available only in Japan, for a fee)

For stable system operation, we recommend concluding our SupportDesk agreement, which provides a maintenance and operation support service. SupportDesk agreement customers receive a same-day response service for hardware problems. They are eligible for regular checkups, remote notification of potential-failure predictions, and information on system problems. Moreover, they can avail themselves of other services such as troubleshooting support by phone for hardware and software problems, and access to operation support information from a dedicated website for our customers. For details, see "Product support" on the SupportDesk webpage (http://jp.fujitsu.com/solutions/support/sdk/index.html).

Product and service inquiries

For all product use and technical inquiries, contact the distributor where you purchased your product, or a Fujitsu sales representative or systems engineer (SE). If you do not know the appropriate contact address for inquiries about the PRIMEQUEST 1000 series, use the Fujitsu contact line.

Fujitsu contact line

We accept Web inquiries. For details, visit our website:
https://www-s.fujitsu.com/global/contact/computing/PRMQST_feedback.html

Warranty

If a component failure occurs during the warranty period, we will repair it free of charge in accordance with the terms of the warranty agreement. For details, see the warranty.

Before requesting a repair

If a problem occurs with the product, confirm the problem by referring to 11.2 Troubleshooting in this manual. If the error recurs, contact your sales representative or a field engineer. Confirm the model name and serial number shown on the label affixed to the right front of the device and report it. Also check any other required items beforehand according to 11.2 Troubleshooting. The system settings saved by the customer will be used during maintenance.

Revision History

Edition	Date	Revised location (type) (*)	Description
01	2010-02-09	-	-
02	2010-03-12	All pages	Incorporated differences in *Errata and Addenda* (C122-E119-01EN)

Edition	Date	Revised location (type) (*)	Description
03	2010-08-20	All pages	Incorporated differences in *Errata and Addenda* (C122-E119-02EN to C122-E119-10EN)
04	2011-04-28	All pages	- Added items about 1800E2 - Incorporated differences in *Errata and Addenda* (C122-E119-11EN to C122-E119-18EN)
05	2011-05-31	All pages	Incorporated differences in *Errata and Addenda* (C122-E119-19EN)
06	2011-12-20	All pages	Incorporated differences in *Errata and Addenda* (C122-E119-20EN to C122-E119-24EN)
07	2012-07-17	All pages	Changed and added descriptions mainly concerning the following items. - Video redirection notes - Stopping the ServerView RAID service - FC card replacement procedure and explanation - [ASR Control] window display/ setting items - [Partition Event Log] window
08	2013-01-25	All pages	- Added descriptions about Windows Server 2012 - Added descriptions about 785 GB/1.2 TB internal solid-state drives that use PCI slots
09	2013-07-02	Chapter 3 Chapter 11	Added descriptions about GSPB replacement
10	2013-11-19	Chapter 3	- Added descriptions to Notes on VMware in 3.2.1 Reserved SB - Added descriptions on Windows Software RAID and Windows configuration

* Chapter, section, and item numbers in the "Revised location" column refer to those in the latest edition of the document. However, a number marked with an asterisk (*) denotes a chapter, section, or item in a previous edition of the document.

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CHAPTER 1 Network Environment Setup and Tool Installation

This chapter describes the external network environment and management tool installation for the PRIMEQUEST 1000 series. For an overview of the management tools used for the PRIMEQUEST 1000 series, see Chapter 8 Operations Management Tools in the *PRIMEQUEST 1000 Series General Description* (C122-B022EN).

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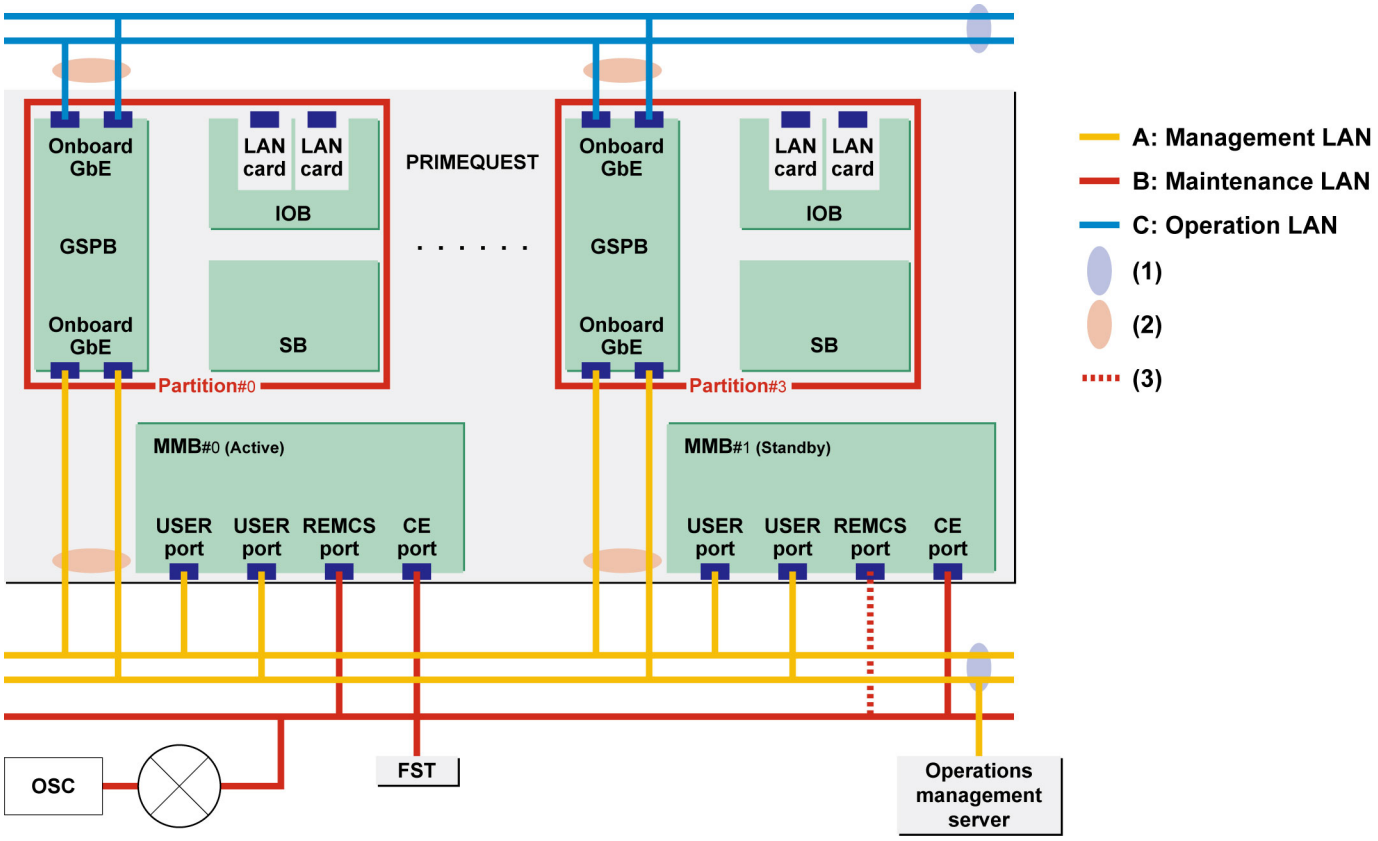
1.6 Management Tool Operating Conditions and Use 18

1.1 External Network Configuration

The following diagram shows the external network configuration for the PRIMEQUEST 1000 series.



No.	Description
(1)	SW redundancy
(2)	Redundancy by teaming (GLS or equivalent)
(3)	Disabled on the standby side

FIGURE 1.1 External network configuration

The following table lists the external networks. The letters A, B, and C correspond to those in FIGURE 1.1 External network configuration.

TABLE 1.1 External network names and functions

Letter	External network name	Function
A	Management LAN	- MMB Web-UI/CLI operations - Operations management server - Text console redirection - Video redirection - PRIMECLUSTER linkage

Letter	External network name	Function
		- Systemwalker linkage - ServerView linkage - REMCS connection
B	Maintenance LAN	- FST (CE terminal) connection - REMCS connection
C	Operation LAN (production LAN)	For job operations

The following diagram shows the functions of external networks for the PRIMEQUEST 1000 series.

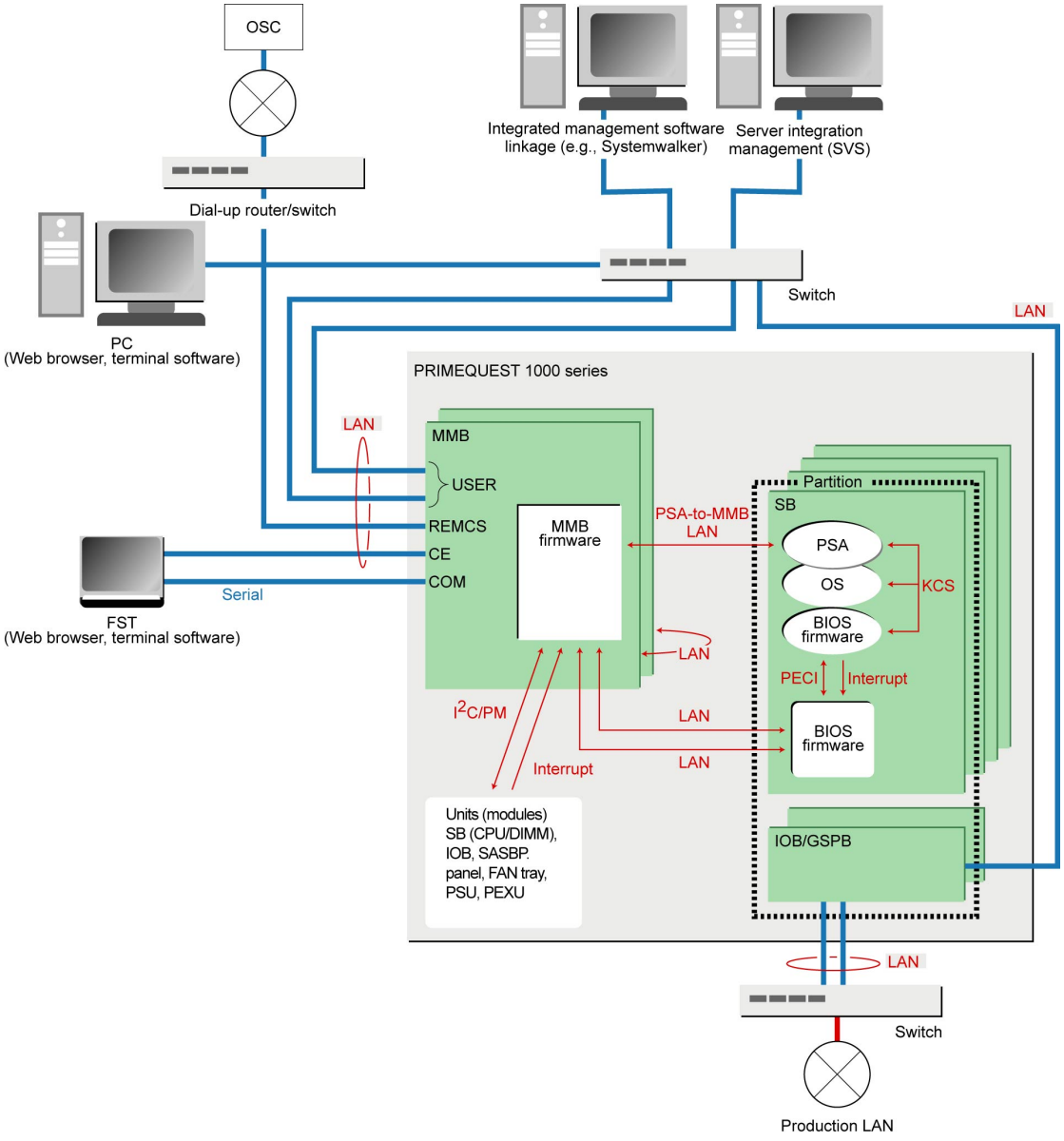


FIGURE 1.2 External network functions

1.2 How to Configure the External Networks (Management LAN/ Maintenance LAN/Production LAN)

The PRIMEQUEST 1000 series server must be connected to the following three types of external networks. The respective external networks are dedicated to security and load distribution. (See FIGURE 1.1 External network configuration.)

- Management LAN
- Maintenance LAN
- Production LAN

Note

You can connect the management LAN and production LAN to the same subnet, but you need to connect the maintenance LAN to another subnet.

This section describes the IP addresses for the PRIMEQUEST 1000 series server.

1.2.1 IP addresses used in the PRIMEQUEST 1000 series server

Each of the SB, GSPB, and MMB units in the PRIMEQUEST 1000 series server have network interfaces. Each port of these network interfaces must be assigned an IP address.
To the ports, assign IP addresses appropriate to the external network environment of the PRIMEQUEST 1000 series server.

The following describes the IP addresses assigned to the ports.
TABLE 1.2 IP addresses for the PRIMEQUEST 1000 series server (IP addresses set from the MMB) lists the IP addresses that are set from the MMB. TABLE 1.3 IP addresses for the PRIMEQUEST 1000 series server (set from the operating system in a partition) lists the IP addresses that are set from the operating system.
The IP addresses in TABLE 1.2 IP addresses for the PRIMEQUEST 1000 series server (IP addresses set from the MMB) are assigned to the NICs (network interface controllers) on the MMBs. Each NIC is connected to an SB or an external network port of the MMB through the switching hub on the MMB. The MMB firmware uses the IP addresses.
The standard configuration has one MMB. For a dual MMB configuration, which has two MMBs, assign a common virtual IP address to both MMBs. In addition to the virtual IP address, assign one physical IP address to each MMB.

TABLE 1.2 IP addresses for the PRIMEQUEST 1000 series server (IP addresses set from the MMB)

Name	NIC	Type	IP address setting method	Description
- Management LAN IP address: MMB Virtual/Physical IP address This IP address is used for communication when the MMB is connected to the management LAN. The physical IP address is assigned to the NIC of the user port of each MMB, and the virtual IP address is assigned commonly to the duplicated MMBs. The virtual IP address is used for access from a PC etc. on the management LAN. The virtual IP is inherited by an active MMB.				

Name	NIC	Type	IP address setting method	Description
Virtual IP Address	MMB (common) (*1)	Virtual IP address	Set it from the MMB CLI or MMB Web-UI.	The PC connected to the management LAN uses this IP address to communicate (via the Web, telnet, etc.) with the (active) MMB. The PC user need not be aware of which MMB is active, MMB#0 or MMB#1.
MMB#0 IP Address	MMB#0 (*1)	Physical IP address	Set it from the MMB CLI or MMB Web-UI.	The PC connected to the management LAN uses this IP address to communicate with MMB#0. (*2)
MMB#1 IP Address	MMB#1 (*1)	Physical IP address	Set it from the MMB CLI or MMB Web-UI.	The PC connected to the management LAN uses this IP address to communicate with MMB#1. (*2)
- Maintenance LAN IP address: Maintenance IP address This IP address is used for communication when the MMB is connected to the maintenance LAN.				
Maintenance IP Address	MMB (common)	Physical IP address (*3)	Set it from the MMB CLI or MMB Web-UI.	This IP address is used for communication with REMCS, without using the management LAN. The MMB also uses the IP address to communicate with the maintenance terminal connected to the CE port.
- MMB-PSA LAN IP address: MMB-PSA IP Address This is a dedicated IP address for MMB communication with PSA (on the PRIMEQUEST 1800E) or SVS (on the PRIMEQUEST 1800E2) running on the operating system in each partition.				
MMB-PSA IP Address	MMB (common) (*4)	Physical IP address (*3)	Set it from the MMB Web-UI.	This is a dedicated IP address for communication with PSA (on the PRIMEQUEST 1800E) or SVS (on the PRIMEQUEST 1800E2) running on the operating system in each partition.
- Console redirection IP address: Console Redirection IP Address				
Console Redirection IP Address	BMC	Physical IP address (*5)	Set it from the MMB Web-UI.	This IP address is used to access the console redirection function in each partition from the PC on the management LAN. An IP address on the management LAN is assigned to each partition.

*1 These three addresses must have the same subnet address.

*2 The server administrator need not be concerned with the individual IP addresses specified for communication.

*3 The IP address is intended only for communication with the active MMB.

*4 It is connected to the PSA-to-MMB communication LAN inside the cabinet, and it is not connected to any external network. The assigned IP address must be in a different subnet from the management LAN, maintenance LAN, or production LAN. The default setting is 172.30.0.1/24, and it does not have to be changed unless it is in conflict with another subnet.

*5 This IP address is to access the console redirection function provided by BMC. It accesses BMC from the user port on the management LAN of MMB via the dedicated network for BMC-to-MMB communication inside the cabinet.
MMB changes the local IP address of BMC to the IP address on the management LAN by NAT. From the PC on the management LAN, the console redirection function of BMC is used via MMB.

*6 If Disable is set for this address, the PSA Web-UI cannot be viewed. Also, neither REMCS notification nor e-mail notification related to PSA (on the PRIMEQUEST 1800E) or SVS (on the PRIMEQUEST 1800E2) is sent.

A separate subnet must be assigned to "1. Management LAN", "2. Maintenance LAN" (external network), and "3. MMB-PSA LAN" (inside the cabinet LAN).
Because "3. MMB-PSA LAN" is closed to the outside of the cabinet, the same subnet as that for "3.MMB-PSA LAN" in another cabinet can be used.
For the IP address to be assigned to "4. Console redirection", the same subnet as that assigned to "1. Management LAN" must be used.

Remarks
MMB uses the following subnets permanently for internal communication.
The following subnets cannot be specified:
127.1.1.0/24
127.1.2.0/24
127.1.3.0/24

The ICH (I/O controller hub) on an SB in each partition has a 100 Mb Ethernet port connected with the PSA-to-MMB communication LAN inside the cabinet. The operating system assigns the IP address of the 100 Mb Ethernet port.

TABLE 1.3 IP addresses for the PRIMEQUEST 1000 series server (set from the operating system in a partition)

LAN port	IP address setting method	Description
100 MbE port on SB (NIC in ICH) (*1)	Set it from the OS in each partition.	100 MbE port connected to the PSA-to-MMB LAN inside the cabinet. This IP address and the IP address of the MMB-PSA IP Address in TABLE 1.2 IP addresses for the PRIMEQUEST 1000 series server (IP addresses set from the MMB) IP addresses for the PRIMEQUEST 1000 series server (IP addresses set from the MMB) are in the same subnet. An IP address must be assigned to each partition.

LAN port	IP address setting method	Description
GbE port in GSPB	Set it from the OS in each partition.	This depends on the partition configuration. The number of LGSPBs (0 to 4) in the configuration is multiplied by 4.
Network card mounted in PCI Express slot in IOB or PCI_Box.	Set it from the OS in each partition.	Each port is connected to a network outside the cabinet. The ports in the relevant partition must have IP addresses. (Assign IP addresses to the ports used for actual operation.)

*1 The default IP address (172.30.0.[partition number + 2]) is assigned during installation of PSA + SVS (on the PRIMEQUEST 1800E) or SVS (on the PRIMEQUEST 1800E2). The default IP address can be used unless it is in conflict with the one in the other subnet.
For details on the partition number, see 1.3.4 [Partition Configuration] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).
If it is in conflict with the one in the other subnet, change it manually. For details on the setting procedure, see the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

Remarks

For NIC on the partition side of PSA-MMB LAN, use NIC in ICH on the Home SB. The network device name is not defined uniquely. It is searched in NIC in ICH on the Home SB by using the bus number, device number, and function number assigned to NIC.

Because the Reserved SB function keeps the communication between the PSA and MMB even if the Home SB is switched, the MMB writes over the MAC address of the NIC in ICH on the Home SB and keeps the same MAC address as that before the SB was switched.
For this MAC address, a unique value is assigned to each partition and managed as system FRU information so that it is unique per cabinet.

1.3 Management LAN

This section describes the configuration of the management LAN for the PRIMEQUEST 1000 series.

1.3.1 Overview of the management LAN

The MMB has two GbE LAN ports (USER ports) dedicated to the management LAN.
The partition side can use the GbE LAN port on the GSPB as a management LAN port. The PCL communications/ operations management server is connected to the MMB USER port through an external switch.

IP addresses of the management LAN (MMB)

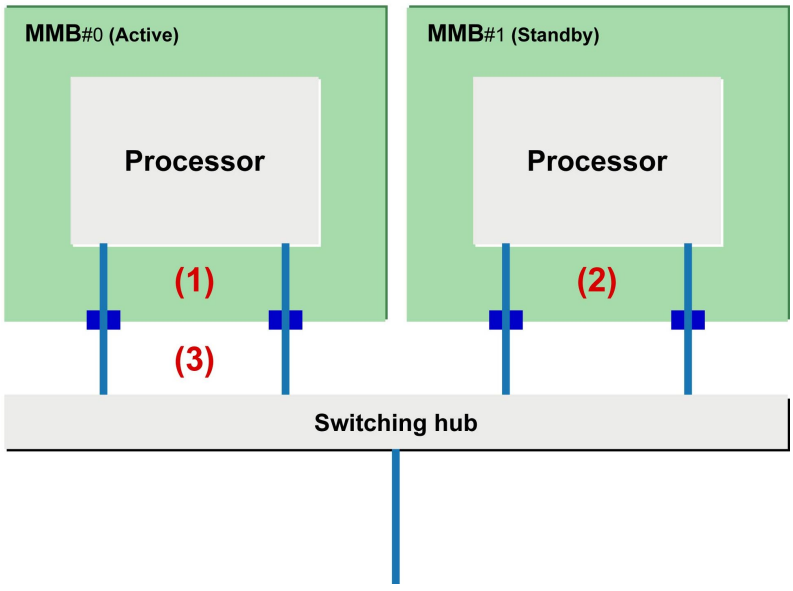
Each MMB has one physical IP address for the management interface of the PRIMEQUEST 1000 series server. In addition to that, the primary MMB shares a common virtual IP address in the system. You can set these IP addresses from the MMB Web-UI or CLI.

Remarks

Virtual LAN interfaces are used for the management LAN interfaces. The physical LAN interfaces are used only for recognizing the respective MMBs.

The physical LAN interface of each MMB makes redundant the two User ports located in that MMB, using the interface redundancy function, to create a single LAN interface.
Virtual LAN interfaces handle the common virtual IP address shared between the two redundant MMBs. The Virtual LAN interfaces share the physical LAN interfaces, which are ports on the two MMBs. The ports are treated as valid channels on the active MMB. Any switching of the active MMB causes switching of the corresponding connections to Virtual LAN channels.

The following shows a management LAN configuration diagram. The IP addresses are examples. The addresses depend on the settings.



No.	Description
(1)	Physical LAN IP example (MMB #0): 10.20.30.101
(2)	Physical LAN IP example (MMB #1): 10.20.30.102
(3)	Virtual LAN IP example: 10.20.30.100

FIGURE 1.3 Management LAN configuration

If either USER port fails, the interface redundancy function switches to the other port in the MMB to ensure continuous service. If a failure occurs in the active MMB itself, the Virtual LAN channels become unusable. Then, the standby MMB inherits the virtual IP address from the active MMB to ensure continuous service.

The following interfaces are available with a configured management LAN:

Interfaces available to the system administrator:

- Web-UI interface using HTTP/HTTPS
- CLI interface via telnet/SSH
- Partition and console operations through the video redirection function

Interface available to system management software:

- RMCP and RMCP + interface

Remarks

The restrictions on management LAN interfaces other than Virtual LAN channels are described below.

TABLE 1.4 Restrictions on the management LAN

Channel name	RMCP connection (UDP)	Web-UI connection (http/https)	CLI connection (telnet/ssh)
Virtual LAN channel	Possible	Possible	Possible
Physical LAN channel (Active MMB)	Possible	Not possible	Possible
Physical LAN channel (Standby MMB)	Possible with restrictions (*1)(*2)	Not possible	Possible with restrictions (*3)

*1 The connection cannot send or receive data of over 4 Kbytes.
*2 The connection sends data to the active MMB, so adequate performance cannot be obtained.
*3 Only the following commands can be executed:
- Set command
set active_mmb 0
- Show commands
show active_mmb
show access_control
show date
show timezone
show gateway
show http

show http_port
show https
show https_port
show ssh
show ssh_port
show telnet
show telnet_port
show ip
show network
show exit_code
ping
who
netck arptbl
netck arping
netck ifconfig
netck stat
show user_list
help
show snmp sys_location
show snmp sys_contact
show snmp community
show snmp trap
show maintenance_ip

IP address of the management LAN (partition)

To the partition side, an IP address of the management LAN must be assigned to communicate with PSA running on the operating system or SVS from the terminal, etc. on the management LAN. The IP address is assigned to the GbE port on the GSPB, the IOB, or the PCI_Box mounted on the network card. Also, for monitoring with SVOM, an IP address must be assigned to the management LAN.

When it is linked with PRIMECLUSTER, the PSA (on the PRIMEQUEST 1800E) or SVS (on the PRIMEQUEST 1800E2) on the partition side communicates with the user port of the MMB via the management LAN. It also provides the function for monitoring the status of the cluster node and the node switching function.

1.3.2 How to configure the management LAN

The network for MMB access from external terminals is the management LAN. The MMB has three types of network port: USER port (duplicated) used for management, CE port used for maintenance, and REMCS port used for remote maintenance.
The REMCS port and CE port are connected to one NIC through a switching hub. The PSA-to-MMB network in the PRIMEQUEST 1000 series server is a dedicated LAN.
For management LAN-related settings for MMB access, use the CLI or the [Network Configuration] menu in the Web-UI.
For details on the network configuration, see 1.1 External Network Configuration.

The following lists the settings for the management LAN configuration. Only a user with Administrator privileges can make management LAN-related settings.

For details on the setting window, see Chapter 1 MMB Web-UI (Web User Interface) Operations in the *PRIMEQUEST 1000 Series Tool Reference* (c122-E110EN).

TABLE 1.5 Parts of the management LAN configuration

Display/Setting item	Description
Network Interface: IP address and other settings for MMB access	
Virtual IP Address	Virtual IP address. In a dual MMB configuration, the IP address is inherited during MMB switching. Host Name/IP Address/Subnet Mask/Gateway Address
MMB#0 (MMB#1) IP Address	Physical IP address of MMB#0 (MMB#1). You set this IP address for MMB#0 (MMB#1) mounted in the system. Enable/Disable setting Interface Name/IP Address/Subnet Mask/Gateway Address
DNS (optional)	Option. It specifies the IP address of the DNS server used. The default is Disable. Enable/Disable setting IP Address: DNS Server 1/DNS Server 2/DNS Server 3
Management LAN	Specifies duplication of the management LAN ports. The default is Disable. (Only the ports on the #0 side are enabled.) Enable/Disable setting
Maintenance IP Address	Specifies the REMCS/CE port. The default is Disable. Enable/Disable setting IP Address/Subnet Mask/SMTP Address
MMB-PSA IP Address	IP Address/Subnet Mask/Gateway Address Specifies the NIC on the MMB of the PSA-to-MMB LAN. The default is Enable and the specified [IP Address] value. The MMB blocks communication between partitions.
Management LAN Port Configuration: Management LAN port settings	
Speed/Duplex for MMB#0 (MMB#1)	Specifies a Speed/Duplex value for the MMB#0 (MMB#1) LAN ports. Port: USER Port, Maintenance Port Setting value: Auto (default), 1G/Full, 100M/Full, 100M/Half, 10M/Full, 10M/Half The MMB USER port is duplicated. The speed of 1 Gbps can be specified only for the USER ports. The possible settings for the respective ports depend on the MMB hardware configuration.
Network Protocols: Network protocol settings	
HTTP, HTTPS, telnet, SSH, SNMP	Specifies whether to enable or disable a protocol, the port number, and the Timeout time.
SNMP Configuration: SNMP-related settings	

Display/Setting item	Description
SNMP Community	Specifies SNMP System Information and Community/User values. - System Information: Specifies System Location and System Contact values for SNMP. It also displays the system name specified from [System] - [System Information]. - Community: Can specify up to 16 Community/User items. Each Community/User item includes the access-permitted IP address, SNMP version, access permission, and authentication settings. For settings specific to SNMP v3, use the SNMP v3 Configuration menu.
SNMP Trap	Specifies SNMP trap destinations. - You can set up to 16 destinations. Each trap destination item includes the Community/User name, destination IP address, SNMP version, and authentication level settings. - [Test Trap] button: Sends a test trap to the specified trap destination.
SNMP v3 Configuration: Settings specific to SNMP v3	
Engine ID	Specifies the Engine ID. - Enter the encryption hash function, authentication passphrase, and encryption passphrase for users.
SSL: SSL settings	
Create CSR	Creates a private key and a request for a signature (CSR: Certificate Signing Request) - SSL certificate status: Displays the current status of SSL certificate installation. - Key length: Length of the private key, 1024 bits or 2048 bits - Entered information on the owner specified for the CSR - Country, prefecture, city/town, organization, department, server, e-mail address - [Create CSR] button: Displays a confirmation dialog box. Clicking [OK] creates a new private key and a request for a signature. After completion, a dialog box appears. Clicking [OK] registers the private key and causes a jump to the [Export Key/CSR] window. Clicking [Cancel] gives an instruction to discard the created private key and CSR.
Export Key/CSR	Exports an MMB private key/CSR (backup). - [Export Key] button: Exports a private key. - [Export CSR] button: Exports a CSR. **Note** Clicking the [Export Key] button/[Export CSR] button using FireFox 4 or later flashes a save confirmation dialog box, resulting in the secret key not being downloadable.Therefore, use Internet Explorer during [Export Key/Export CSR] window manipulation.
Import Certificate	Imports a signed electronic certificate sent from a certificate authority. To import a file, specify the file, and click the [Import] button.
Create Selfsigned Certificate	Creates a self-signed certificate.

Display/Setting item	Description
	- SSL certificate status: Displays the current status of self-signed certificate installation. - Term: Specifies the term of validity (number of days) of the self-signed certificate. - The other settings are the same as on the [Create CSR] window. - [Create Selfsigned Certificate] button: Creates a self-signed certificate.
SSH: SSH settings	
Create SSH Server Key	Creates an SSH server private key. - SSH Server Key Status: Displays the status of SSH server key installation. - [Create SSH Server Key] button: Creates a private key. After creation is completed, a confirmation dialog box appears. Clicking [OK] installs the created key. Clicking [Cancel] discards it.
Remote Server Management: User settings for remote control of the MMB via **RMCP** - Use the [Edit User] button to select the user to be edited. The default settings for all users is [No Access] and [Disable]. - You can edit the user name, password, permission, and status (Enable/Disable) in the [Edit User] window. - To deny access to a user, set [No Access] for permission or [Disable] for [Status].	
Access Control: Access control settings for network protocols	
[Add Filter]/[Edit Filter]/ [Remove Filter] button	Adds, edits, or deletes a filter.

[Edit Filter] window	- Protocol: Select the target protocol (HTTP/HTTPS/telnet/SSH/SNMP).
	- Access Control: Select [Enable] or [Disable].
	  - Disable: Denies access by any IP address.
	  - Enable: Permits access by only the specified IP addresses.
	- IP Address/Subnet Mask: You can specify this item only if the [Access Control] setting is [Enable]. The filtering permits access by only the IP addresses specified here.

Alarm E-Mail: Settings for e-mail notification of an event	
Alarm E-Mail	Used to select whether to send e-mail for the occurrence of an event (Enable/ Disable).
From	Sender address
To	Destination address
SMTP Server	IP address or FQDN of the SMTP server
Subject	E-mail title
[Filter] button	Used to edit Alarm E-mail transmission filter settings. The occurrence of any event specified in the filter settings is reported by e-mail. The default for target events is all events. - Severity: Target severity (Error/Warning/Info) - Partition: Target partition - Unit: Target unit

Display/Setting item	Description
	- Source: Target source (CPU/DIMM/Chipset/Voltage/Temperature/ Other)
[Test E-Mail] button	Sends test e-mail.
Video redirection/remote storage network settings	
[Partition] - [Console Redirection Setup] menu	The video redirection/remote storage network relays traffic through the MMB, so the BMC IP address is not seen by users. Users access the system via the management LAN of the MMB. Here, specify the IP address used for access by the video redirection client (Java applet). The MMB handles address conversion between the specified address and BMC IP address.

The settings of the management LAN on the partition side are made on the operating system. These are required to access PSA, SVS, etc. from a management PC etc. on the management LAN. PSA (on the PRIMEQUEST 1800E) or SVS (on the PRIMEQUEST 1800E2) also communicates with the MMB via the management LAN to monitor and to switch cluster nodes in the PRIMECLUSTER linkage.

To the NIC to be used for the management LAN, the GbE port on GSPB, the IOB, or the network card mounted in the PCI_Box is assigned.
The subnet of the management LAN shares the virtual IP address and the physical address of the MMB, which are specified by Web-UI/CLI on the MMB.

The management LAN and production LAN can be configured in the same subnet. In such case, an IP address is assigned to both the management LAN and the production LAN on the partition connected to the subnet of the LAN to which the MMB User Port is connected.

1.3.3 Redundant configuration of the management LAN

For the MMB, only MMB#0 is mounted as standard. By mounting MMB#1, the MMB can be duplicated. When the MMB detects an error in the MMB itself, it switches the active MMB so that operations can continue. When the active MMB is switched, the virtual IP address is inherited by the MMB that becomes active. Therefore, the administrator does not to need to consider which MMB is active.

Because the MMB cannot recognize errors occurring in the path for accessing the MMB user port from the management LAN, it is unable to recover from them by switching the active MMB. Therefore, two user ports of the management LAN are mounted on the MMB. This redundant configuration enables recovery from management LAN errors. The redundant configuration of the user port is disabled as standard, and only user port #0 is enabled.

When the redundant configuration of the user port of the management LAN is enabled, the NICs on both user port #0 and user port #1 are enabled. These two NICs appear as one virtual interface from external devices because of the bonding function (each MMB has a physical address and a MAC address).
The MMB monitors errors of the management LAN (including connections to unit-external switches and LAN cable disconnections). When it detects an error, it switches the duplicated NIC so that the monitoring operation, which includes the Web-UI operations, can continue. The values of the physical IP address and the MAC address of the MMB prior to switching are maintained.

To set up the management LAN in a redundant configuration, select [Network Configuration] - [Network Interface] from the MMB Web-UI, and then set Enable for [Dualization] of [Maintenance LAN].

For details on how to set it up, see 1.5.2 [Network Interface] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

For the redundant configuration of the management LAN on the partition side, duplicate the NIC by teaming with Linux Bonding driver, GLS or Intel PROSet.

When the MMB is duplicated, but the management LAN user port of the MMB is not duplicated, if an error occurs on the management LAN, MMB access is disabled. Because the MMB does not recognize its error, it does not automatically switch the active MMB, and the virtual IP address of the MMB cannot be switched to the available MMB. In such cases, the active MMB must be switched manually. The procedure is described below.

- (When MMB#0 is active, and MMB#1 is standby, an error occurs during an attempt by the management LAN to access the user port on the MMB#0 side, and MMB#0 access is disabled)
    1. Connect to the physical IP address of the management LAN user port on MMB#1 with telnet/ssh.
    2. Execute the following commend on MMB#1, and switch the active MMB to MMB#1.

```
> set active_mmb 1
```

    3. The virtual IP address of the MMB is switched to MMB#1, and access is enabled with the virtual IP address.

1.4 Maintenance LAN/REMCS LAN

The MMB provides the following LAN ports for maintenance purposes.

TABLE 1.6 Maintenance LAN/REMCS LAN

Port	Description	Remarks
CE LAN	FST (CE terminal) port for use in maintenance work	100Base-TX, RJ45
REMCS LAN	For a connection with the REMCS Center (*)	100Base-TX, RJ45

*: For REMCS connection without using the management LAN

The port-based VLAN function of the switching hub on the MMB blocks communication between the CE port and REMCS port. The following shows an outline of the maintenance LAN and REMCS LAN of the MMB.

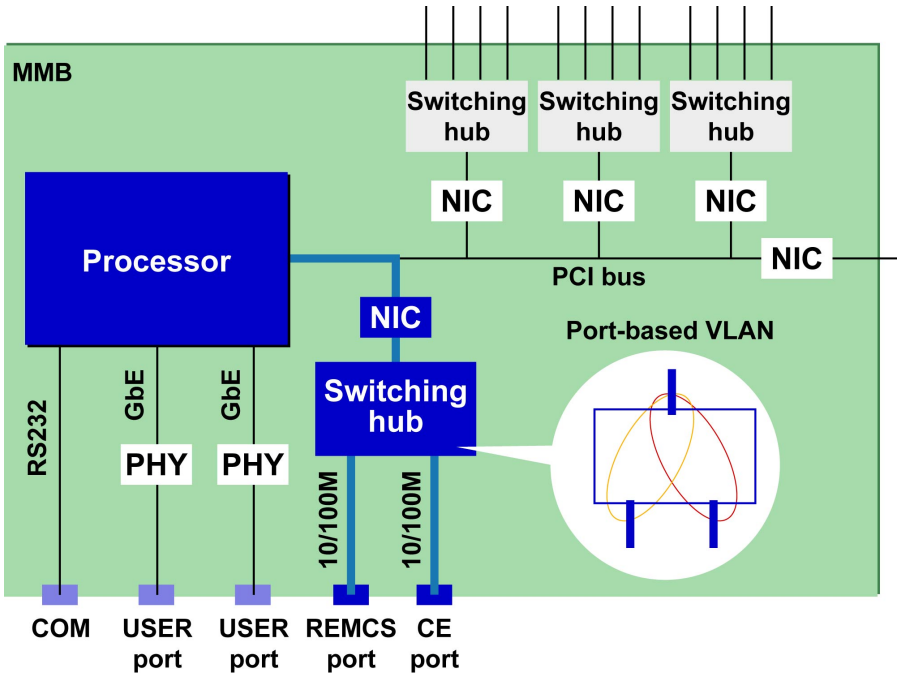


FIGURE 1.4 Maintenance LAN and REMCS LAN of the MMB

The maintenance LAN is configured with Web-UI or CLI of the MMB. The subnet of the maintenance LAN must be separated from the other subnets such as one for the management LAN, the production LAN, etc.
When the MMB is duplicated, the maintenance LAN can only access to the MMB on the active side. The NIC on the standby MMB is disabled.

Remarks
The active and standby MMBs in the PRIMEQUEST 1000 series server each have a CE terminal port used in maintenance and a LAN port for REMCS notification.
Communication through the ports is enabled only on the active MMB and disabled on the standby MMB.
A field engineer configures the maintenance LAN and REMCS LAN during system installation.

1.5 Production LAN

This section describes the configuration of the production LAN for the PRIMEQUEST 1000 series.

1.5.1 Overview of the production LAN

The GSPB includes eight 1000Base-T LAN ports (four ports per LGSPB) for the production LAN.
You can mount additional LAN cards in the PCI Express slots on the IOB and PCI_Box as needed, to use their ports for the production LAN.

1.5.2 Redundancy of the production LAN

This section describes redundancy of the production LAN.

Duplication of the transmission path between servers (high-speed switching method)

For details on duplication of the transmission path between servers, see PRIMECLUSTER documents.

Duplication between the server hub/switch in the same network (Virtual NIC method/NIC switching method)

For details on duplication between the server hub/switch in the same network, see PRIMECLUSTER documents.

Teaming by Intel PROSet

The teaming configuration using Intel PROSet is available. For details, see the help for Intel PROSet.

Notes

There are some precautions on teaming with Intel PROSet(R). For details on the precautions, see APPENDIX G Component Mounting Conditions.

1.6 Management Tool Operating Conditions and Use

This section describes the operating conditions and use of the management tools.

1.6.1 MMB

The MMB Web-UI operating conditions are as follows.

Supported Web browsers

Microsoft Internet Explorer version 6 (Service Pack 1) or later
Mozilla FireFox version 3 or later

Maximum number of Web-UI login users

Up to 16 users can log in to the Web-UI at a time. If 16 users have logged in when another user attempts to log in, a warning dialog box appears and the login attempt is rejected.
The MMB Web-UI login procedure is as follows.

1. Specify the URL of the MMB in the Web browser to connect to the MMB.
   >> The [Login] window appears.

2. Enter your user name and password.
   >> The [Web-UI] window ([System] - [System Status]) appears.

For details on basic Web-UI window operations, see 1.7 Basic Operations in the Web-UI Window in the *PRIMEQUEST 1000 Series User Interface Operating Instructions* (C122-E109EN).
For details on the MMB Web-UI login procedure, see 3.3.4 Logging in to MMB in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

MMB user privileges

User privileges specify the levels of MMB operating privileges held by user accounts.
Only users with Administrator privileges can create, delete, and modify user accounts.
For details on operations permitted (i.e., privileges) in the MMB Web-UI menus, see Chapter 1 MMB Web-UI (Web User Interface) Operations in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

NTP client function setting on the MMB

In the PRIMEQUEST 1000 series, the MMB acts as an NTP client to ensure synchronization with external NTP servers. For details on time synchronization with external NTP servers, see 7.2 Configuring NTP in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

For details on how to synchronize the time on each partition (operating system), see the operating system manual.

For details on management using MMBs, see 4.2 Management by the MMB in the *PRIMEQUEST 1000 Series General Description* (C122-B022EN).
For details on how to use MMBs, see 3.3.4 Logging in to the MMB in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

1.6.2 PSA

For details on management using PSAs, see 4.3 Management by PSA in the *PRIMEQUEST 1000 Series General Description* (C122-B022EN).
For details on the PSA operating conditions and use, see the section about PSA settings in Chapter 5 Work after Operating System Installation (PRIMEQUEST 1800E2) or Chapter 6 Work after Operating System Installation (PRIMEQUEST 1800E) in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

Note

PSA is provided only with the PRIMEQUEST 1800E.
In the PRIMEQUEST 1800E2, SVS provides the management function of PSA. For details on the SVS function, see the SVS manual.

1.6.3 Remote operation (BMC)

Supported Web browsers

Microsoft Internet Explorer version 6 (Service Pack 1) or later
Mozilla FireFox version 3 or later

Required Java Runtime Environment

JRE 1.4.2.10 or later

Notes

- For a terminal whose operating system is Windows Vista or Windows 7, set UAP (User Account Protection) to "Disable."
- For video redirection, text console redirection, or remote storage, a connection may not be established if the network is connected via a proxy. In such cases, change the browser setting to avoid network connection via the proxy.
- To start the video direction or text console redirection function with Internet Explorer, click the mouse while holding down the [Control] key. Even if the following message is displayed, click the mouse while holding down the [Control] key.
  - Message displayed on the status bar of Internet Explorer
    "Pop-up blocked." (To allow the pop-up window to open, click the mouse while holding down the [Ctrl] key.

  With FireFox, you can establish a connection simply by clicking the mouse.
- If "java.net.SocketException:Malformed reply from SOCKS server" occurs when you attempt to establish a video redirection connection, make the following browser setting.
  - For Internet Explorer:
    1. Select [Tools] - [Internet Options] - [Connection] tab - [LAN Settings] - [Proxy Server] - [Advanced].
    2. Uncheck [Use the same proxy server for all protocols].
    3. Clear the Socks field.
  - For FireFox:
    1. Select [Tools] - [Options] - [Network] tab - [Connection Settings].
    2. Check [Manual proxy configuration].
    3. Uncheck [Use this proxy server for all protocols].

4. Clear the SOCKS field.

- When starting the WebBIOS of the RAID controller with an SAS array disk unit, you cannot use text console redirection.
  After terminating the WebBIOS or after rebooting or powering on/off the partition, make the connection and then use text console redirection.
  For details on how to use the WebBIOS, see the *MegaRAID SAS Software*, the *MegaRAID SAS Device Driver Installation*, and the *Modular RAID Controller Installation Guide*.

Maximum number of connections

The following lists the maximum number of connections using the remote operation (BMC) function.

TABLE 1.7 Maximum number of connections using the remote operation function

Item	Description
Video redirection	Up to 2 users can be connected concurrently. However, only 1 user can perform operations. The other user can only refer to information.
Text console redirection	Only 1 user can be connected at any time.
Remote storage	Up to 2 devices can be shared.

The PRIMEQUEST 1800E with an integrated firmware version earlier than SA11031 displays the following message for any attempt to establish a text console redirection connection that would exceed the maximum number. The attempt will be rejected.

```
Console redirection already in use
```

The PRIMEQUEST 1800E with integrated firmware version SA11031 or later displays the following message for any attempt to establish a text console redirection connection that would exceed the maximum number. The PRIMEQUEST 1800E2, irrespective of the integrated firmware version, would display the following message.

```
Console redirection already in use
  (User xx.xx.xx.xx is currently connected)
   If needed, the current user can be disconnected.

  Do you really want to force disconnect current user (yes/no)?
```

xx.xx.xx.xx: IP address of the current connection

If yes is entered, the currently connected user is switched, and the display goes to the [Text Console Redirection] window.
If no is entered, the display returns to the [Main Menu] window.

The operating conditions for BMC installation of individual BMC functions is described below.

Operating environment settings

You need to make the appropriate settings for video redirection, remote storage, and text console redirection for your network environment. In the [Console Redirection Setup] window of the MMB, set the IP address and subnet mask, and set enable or disable for video redirection, remote storage, and text console redirection.
For details on how to configure the MMB, see 1.3.6 [Console Redirection Setup] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

Video redirection

With the video redirection function, users can access windows for the partition side from a remote location.
When a user starts video redirection from the [Console Redirection] window of the MMB, a Java applet is sent to the user's terminal. Through the Java applet, the terminal displays VGA output sent to the LAN.
User input with the mouse or keyboard on the terminal is routed through the LAN to the partition.

The following shows a diagram of the connection configuration for video redirection.

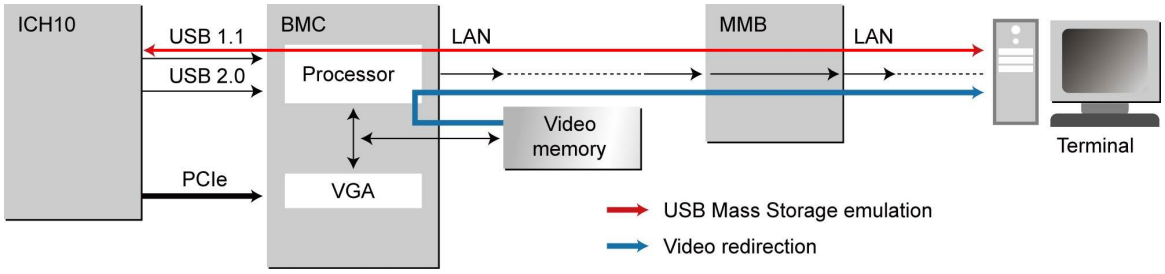


FIGURE 1.5 Connection configuration for video redirection

The following shows the operating sequence of video redirection.

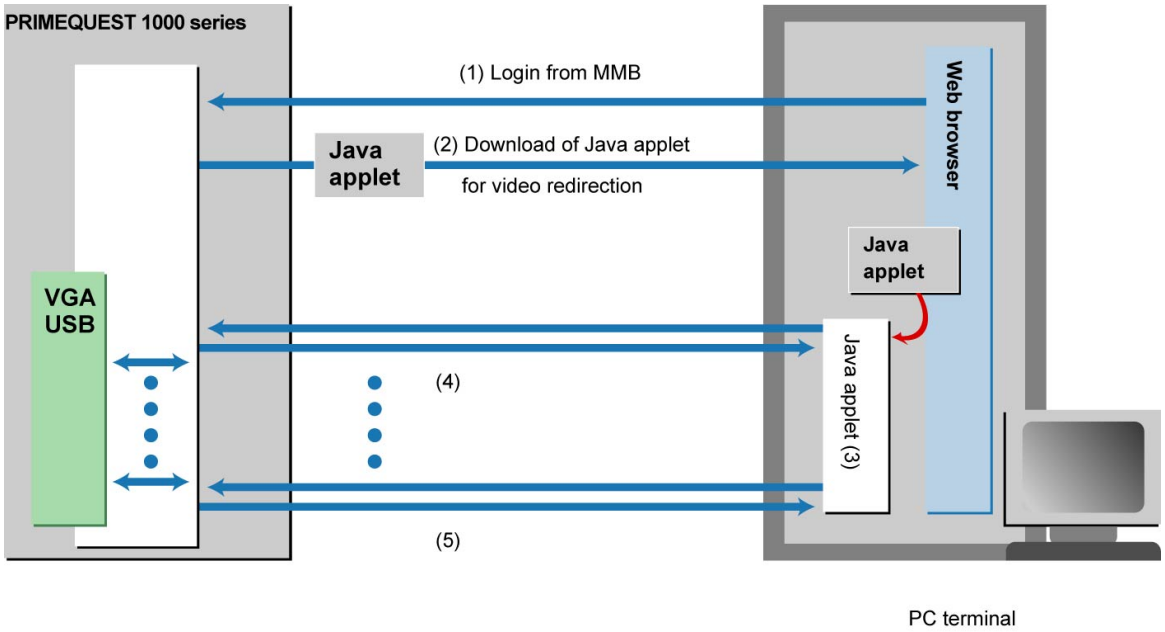
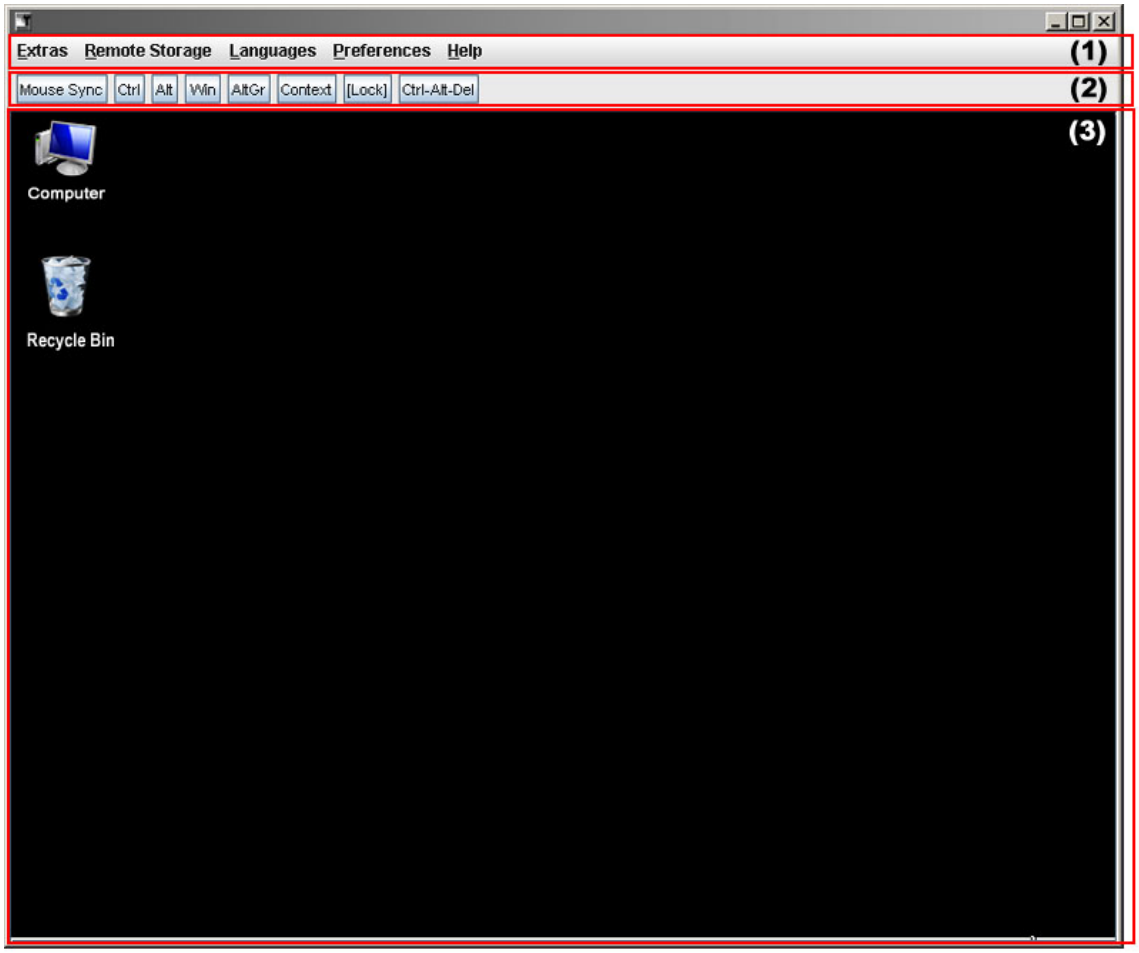


FIGURE 1.6 Operating sequence of video redirection

In the diagram, (1) to (5) indicate the following operations.

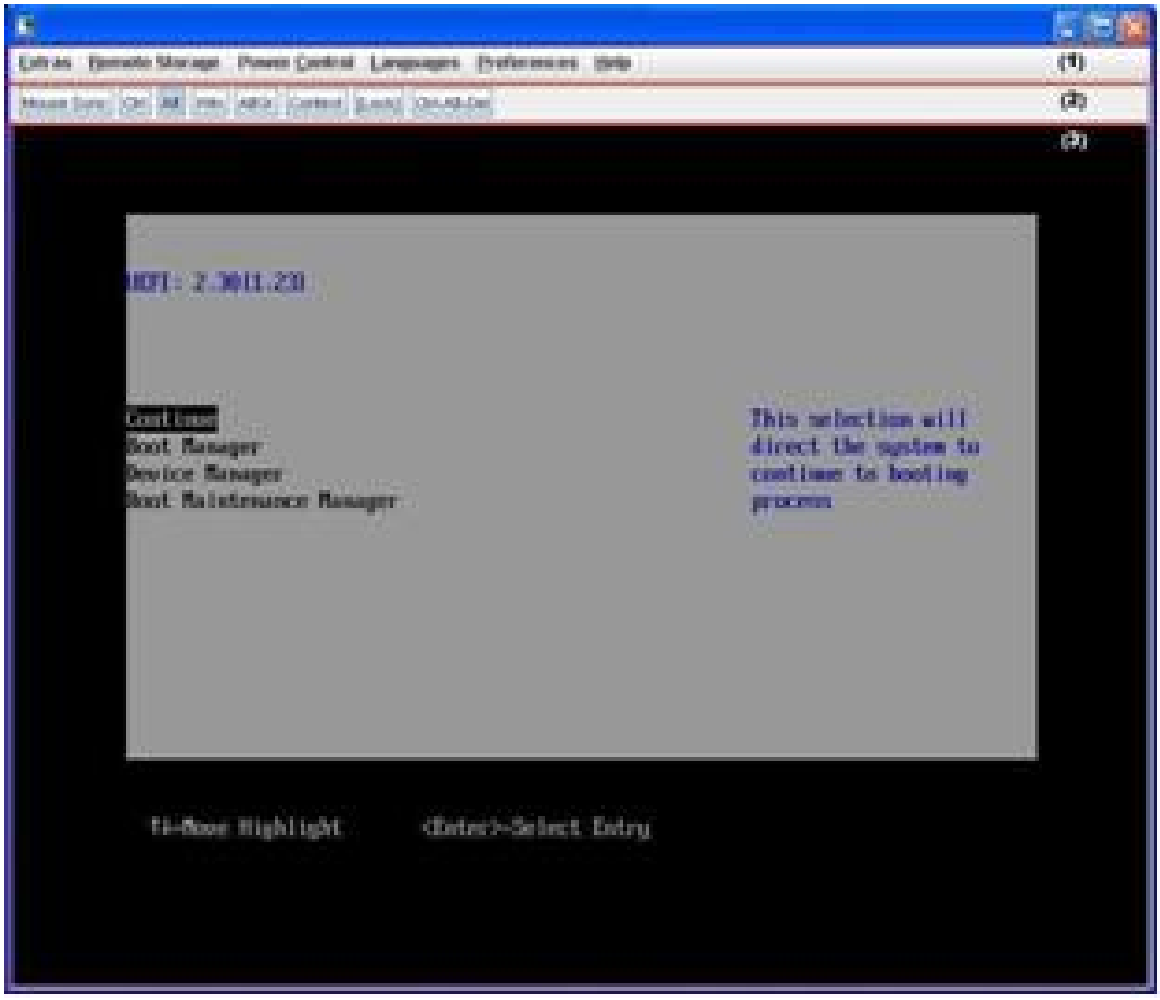
(1) Log in to the server from the terminal.
(2) Display the window, and start video redirection.
(3) You can perform partition operations from the [Video Redirection] window by using the keyboard and mouse.
(4) You can perform partition operations through the Java applet for video redirection.
(5) Exit video redirection.

The following shows an example of the [Video Redirection] window.



No.	Description
(1)	Menus
(2)	Buttons
(3)	Partition pane

FIGURE 1.7 [Video Redirection] window in SA11071 or earlier and SB11062 or earlier



No.	Description
(1)	Menus
(2)	Buttons
(3)	Partition pane

FIGURE 1.8 [Video Redirection] window in SA11081 or later and SB11071 or later

The following lists the menus available in the [Video Redirection] window.

TABLE 1.8 [Video Redirection] window menus

Menu title (*1)	Description
Extras	
- Virtual Keyboard	Displays the virtual keyboard.
- Refresh Screen	Reloads the [Partition] pane.
- Take Full Control...	Sets Full Control mode. This item is enabled only in View Only mode.
- Disconnect Session...	Disconnects other users' remote connections. You can use this item in both Full Control mode and View Only mode.

Menu title (*1)	Description
- Relinquish Full Control...	Sets View Only mode. This item is enabled only in Full Control mode.
- Exit	Exits video redirection.
Remote Storage	
- Remote Storage	Sets the remote storage function.
Power Control (*2)	
Power On (*2)	Turns on the power.
Power Off (*2)	Forcibly turns off the power irrespective of the state of the operating system.
Power Cycle (*2)	Forcibly turns off and on the power irrespective of the state of the operating system.
Press Power Button (*2)	Does not perform any power operation. "Power button pressed (SEL)" is recorded.
Reset (*2)	Forcibly performs a reset irrespective of the state of the operating system.
Pulse NMI (*2)	Issues an NMI.
Graceful Reboot (*2)	Sends a reboot request to ServerView Agent. If ServerView Agent has not been installed, the request does not result in a reboot.
Graceful Shutdown (*2)	Sends a shutdown request to ServerView Agent. If ServerView Agent has not been installed, the request does not result in a shutdown.
Language	
- English	Sets the menu display to English.
- Deutsch (German)	Sets the menu display to German.
- Japanese	Sets the menu display to Japanese.
Preferences	
- Preferences	Makes the setting for the items below.
- Mouse Mode (*2)	Sets the mouse operation mode.
- Keyboard Layout (*2)	Sets the keyboard language type.
- Global Logging (*2)	Sets logging. If None is set, logs are not recorded.
Console Log File (*2)	(No setting)
Low Bandwidth (*2)	Sets the color depth (number of colors). If the communication speed is low, set 3bpp. None: No change 3bpp: 8 colors 8bpp: 256 colors
Internal TCP Port (*2)	Sets the TCP port used for remote storage.
Help	

Menu title (*1)	Description
- Performance	Displays the performance.
- About	Displays the version.

*1: A menu title with a hyphen (-) indicates that it is a submenu item. (The hyphen (-) is not actually displayed.)
*2: The display has been updated in SA11081 or later and SB11071 or later.

The following lists the buttons available in the [Video Redirection] window.

TABLE 1.9 [Video Redirection] window buttons

Button	Description
[Mouse Sync]	Aligns the mouse pointer positions on the PC and partition. (*)
[Ctrl]	Functions in the same way as the [Ctrl] key.
[Alt]	Functions in the same way as the [Alt] key.
[Win]	Functions in the same way as the [Windows] key.
[Context]	Displays the right-click menu of the mouse.
[Lock]	Holds down the [Ctrl], [Alt], or [Windows] key. To unlock, click [Lock] again.
[Ctrl-Alt-Del]	Functions in the same way as pressing the [Ctrl], [Alt], and [Del] keys at the same time.

* If clicking [Mouse Sync] does not synchronize the mouse pointer, make the setting below in the operating system on the target partition for video redirection. Then, click [Mouse Sync] to synchronize the mouse pointer.

For Windows Server 2003 or Windows Server 2008:

- Display properties
  1. Start the Control Panel and select [Display].
  2. Click [Advanced] on the [Settings] tab.
  3. On the [Troubleshooting] tab, move the [Hardware Acceleration] slider to the index that is one increment to the left of the [Full] index. Then, click the [OK] button.
- Mouse properties
  1. Start the Control Panel and select [Mouse].
  2. If [Enhance pointer precision] on the [Pointer Options] tab is checked, uncheck it.
  3. Click the [Mouse Sync] button in the [Video Redirection] window to synchronize the mouse pointer. If the mouse pointer is not synchronized correctly, adjust the slider on [Select a pointer speed].

For Windows Server 2012:

- Mouse properties
  1. Start the Control Panel and select [Mouse].
  2. If [Enhance pointer precision] on the [Pointer Options] tab is checked, uncheck it.

3. Click the [Mouse Sync] button in the [Video Redirection] window to synchronize the mouse pointer. If the mouse pointer is not synchronized correctly, adjust the slider on [Select a pointer speed].

For RHEL5:
Execute the following command:

```
>xset m 0 0
```

Notes:

- If the server screen has a resolution of 800 x 600, it may not display part of the window output by video redirection, or it may display after-images of the mouse pointer (only when Linux is installed).
- When [Windows key] is used to minimize the video redirection window, the [Windows key] remains pressed on the partition side.
  In such case, when the video redirection window is opened again, the Ctrl-Alt-Del key combination may not work, or a command entry may not be available.
  To release [Window key], press [Window key] once while the video redirection window is open.
- While the video redirection is being used, a warning message indicating that the digital signature is expired may be displayed. Since this warning message does not affect the operation of Java Application, click the [Execute] button. To avoid displaying this waning message every time the video redirection is connected, check the check box for [Always trust content from this publisher], and click the [Execute] button.
- Network communication problems between the terminal and PRIMEQUEST may cause a session interruption, resulting in the [Video Redirection] window failing to respond to user operation.
  In such cases, the window cannot be closed normally. Reconnect to the network after forcibly ending the video redirection.

The following lists the functions of video redirection.

TABLE 1.10 Video redirection functions

User function		Description	Remarks
View only mode		The user can display windows but not perform operations in them.	
Full control mode	Mouse	The user can perform mouse operations on the terminal. The mouse pointers on both the terminal and partition move in sync. The capability to show or hide the mouse pointer on the terminal is an option. The relative position (the next position calculated from the operation at the previous position) or absolute position (orthogonal coordinates) can be set as the mouse position.	During use of the mouse, the mouse pointer may not remain in sync between the terminal and partition. To align the pointer positions, click the [Mouse Sync] button.

User function		Description	Remarks
	Keyboard	The user can perform operations from the PC keyboard.	The special keys are not directly operable.
	Monitor	The user can display windows but not perform operations in them.	Partition monitoring can be enabled/disabled.
Special key buttons		Clicking the [Ctrl], [Alt], or [Win] button sends the corresponding operation. Use the [Lock] key to keep any of these buttons clicked.	
Virtual keyboard		This displays the virtual keyboard, which can be used for operations.	
Java client logging	Console	The user can refer to the log.	
	File	This saves the log in a file.	

The workflow for selecting View only mode or Full control mode of the video redirection function is described below.

1. Establish a connection with video redirection. Do so in View only mode.
   >> A pop-up dialog box appears on the user's PC to ask whether to use Full control mode or View only mode.

2. To set Full control mode, click the [OK] button. To set View only mode, click the [Cancel] button.

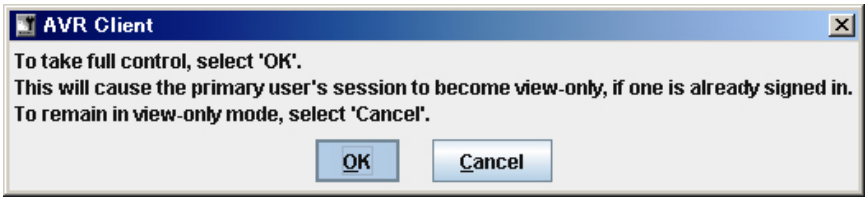

AVR Client
To take full control, select 'OK'.
This will cause the primary user's session to become view-only, if one is already signed in.
To remain in view-only mode, select 'Cancel'.
OK
Cancel

FIGURE 1.9 Selecting Full control mode/View only mode

3. After another PC establishes a connection with video redirection, a pop-up dialog box about the other user's video redirection connection appears. Another dialog box will also appear for selecting Full control mode or View only mode.
   Any other PC with an established video redirection connection will also display a pop-up dialog box about the connection from the other PC.

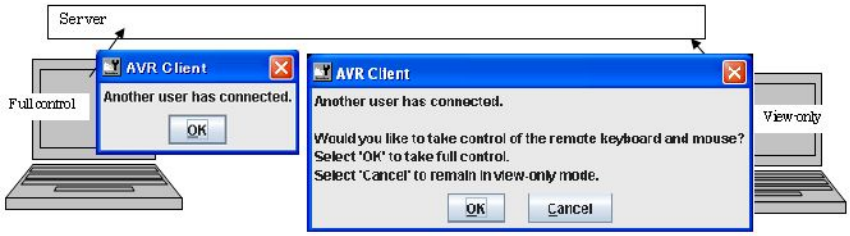


FIGURE 1.10 Case where another user has already established a video redirection connection

4. If the user who established the later connection selects Full control mode, the already connected PC is switched to View only mode. Then, a pop-up dialog box will appear for selecting Full control mode or View only mode.
   To return to Full control mode, click the [OK] button in the dialog box. To set View only mode, click the [Cancel] button.

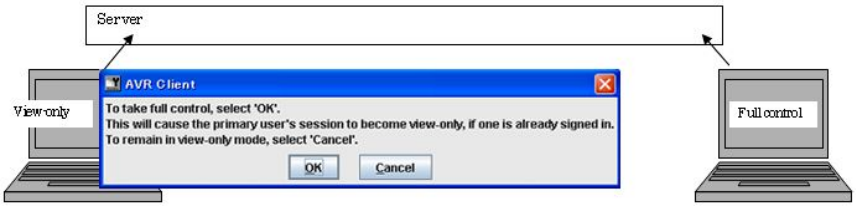

Server
AVR Client
To take full control, select 'OK'.
This will cause the primary user's session to become view-only, if one is already signed in.
To remain in view-only mode, select 'Cancel'.
OK
Cancel
View-only
Full control

FIGURE 1.11 Case where the user who established the later connection selects Full control mode

Text console redirection

The PRIMEQUEST 1000 series provides text console redirection to route serial output from partitions via a LAN. Text console redirection conforms to the specifications of IPMI v2.0 SOL (Serial Over LAN).

Console output to the COM port on the partition is redirected by this function to the terminal connected via a LAN (Japanese display is not supported). Input from the terminal is reported to the COM port on the partition. The connection methods are categorized into three types: and Java applet, telnet, SSH.

Connection period of text console redirection

Text console redirection via telnet and SSH is automatically disconnected after a certain idle time. This automatic disconnection is intended to enhance security. The automatic disconnection time varies depending on the terminal software settings.
For text console redirection connected via telnet, you can disable automatic disconnection by using the keep-alive function of the terminal software (e.g., Tera Term).
To disable automatic disconnection, set an interval less than 10 minutes as the interval for sending a keep-alive packet.
However, for text console redirection connected via SSH, you cannot disable automatic disconnection.

TABLE 1.11 Connection persistence time

How text console redirection is connected	Idle time after which connection is automatically disconnected (Without keep-alive function)	Idle time after which connection is automatically disconnected (With keep-alive function used)
Java Applet	No limit	-
telnet	10 minutes	No limit
SSH	10 minutes	-

Default ID and password values for text console redirection

The default for both [ID] and [Password] for text console redirection is admin.

Changing the password for text console redirection

To change the password for text console redirection, use the following procedure.

The number of characters and the available characters for the password are as follows:

- Number of characters: 1 to 20 characters
- Available characters

  Numeric characters: [0 to 9]

  Alphabetic characters: [a to z][A to Z]

  Symbols: ! " # $ % & ' ( ) = - ^ ~ \ @ ` [ ] { } : * ; + ? < . > , / _ |

1. Use terminal software (such as Tera Term) to connect to the IP for text console redirection via telnet.

2. When the [Main Menu] window is displayed, press the [c] key.

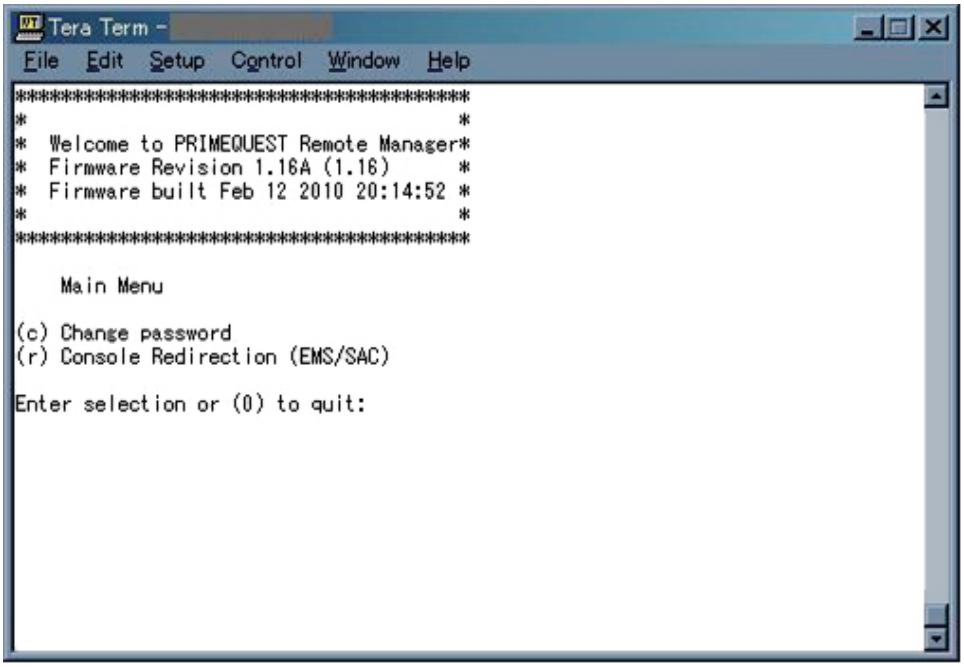

Tera Term -
File Edit Setup Control Window Help
****
* Welcome to PRIMEQUEST Remote Manager*
* Firmware Revision 1.16A (1.16) *
* Firmware built Feb 12 2010 20:14:52 *
****
Main Menu
(c) Change password
(r) Console Redirection (EMS/SAC)
Enter selection or (0) to quit:

FIGURE 1.12 Changing the password for text console redirection (telnet connection)

3. Enter the current password (old passphrase) and a new password (new passphrase).

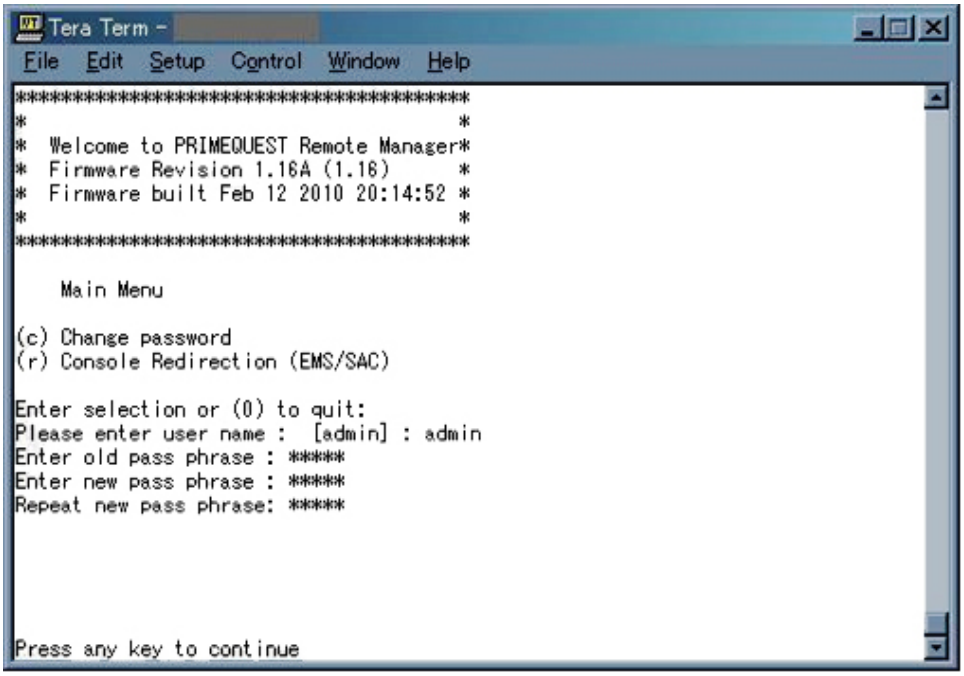

Tera Term -
File Edit Setup Control Window Help
****
* Welcome to PRIMEQUEST Remote Manager*
* Firmware Revision 1.16A (1.16) *
* Firmware built Feb 12 2010 20:14:52 *
****
Main Menu
(c) Change password
(r) Console Redirection (EMS/SAC)
Enter selection or (0) to quit:
Please enter user name : [admin] : admin
Enter old pass phrase : *****
Enter new pass phrase : *****
Repeat new pass phrase: *****
Press any key to continue

FIGURE 1.13 Changing the password for text console redirection (input)

Text console redirection via a Java applet

When the user starts text console redirection from the [Console Redirection] window of the MMB, a Java applet is downloaded to the user's browser. The terminal displays serial output from the partition connected via the LAN. The following shows a connection diagram of text console redirection.

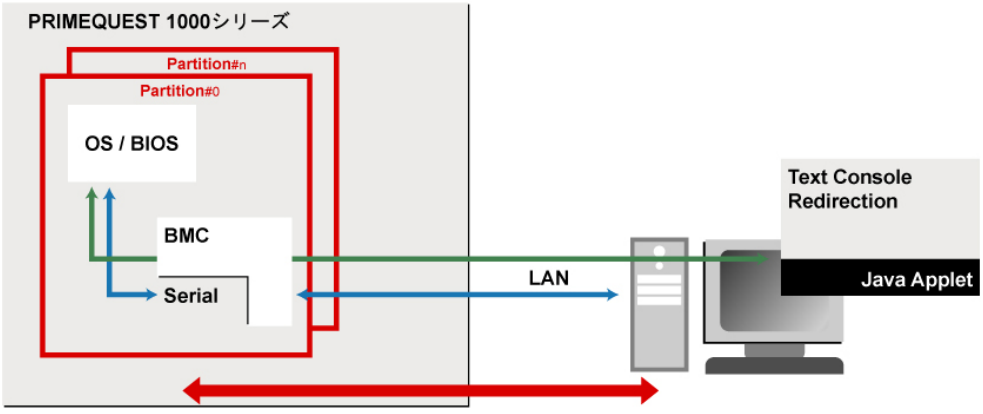
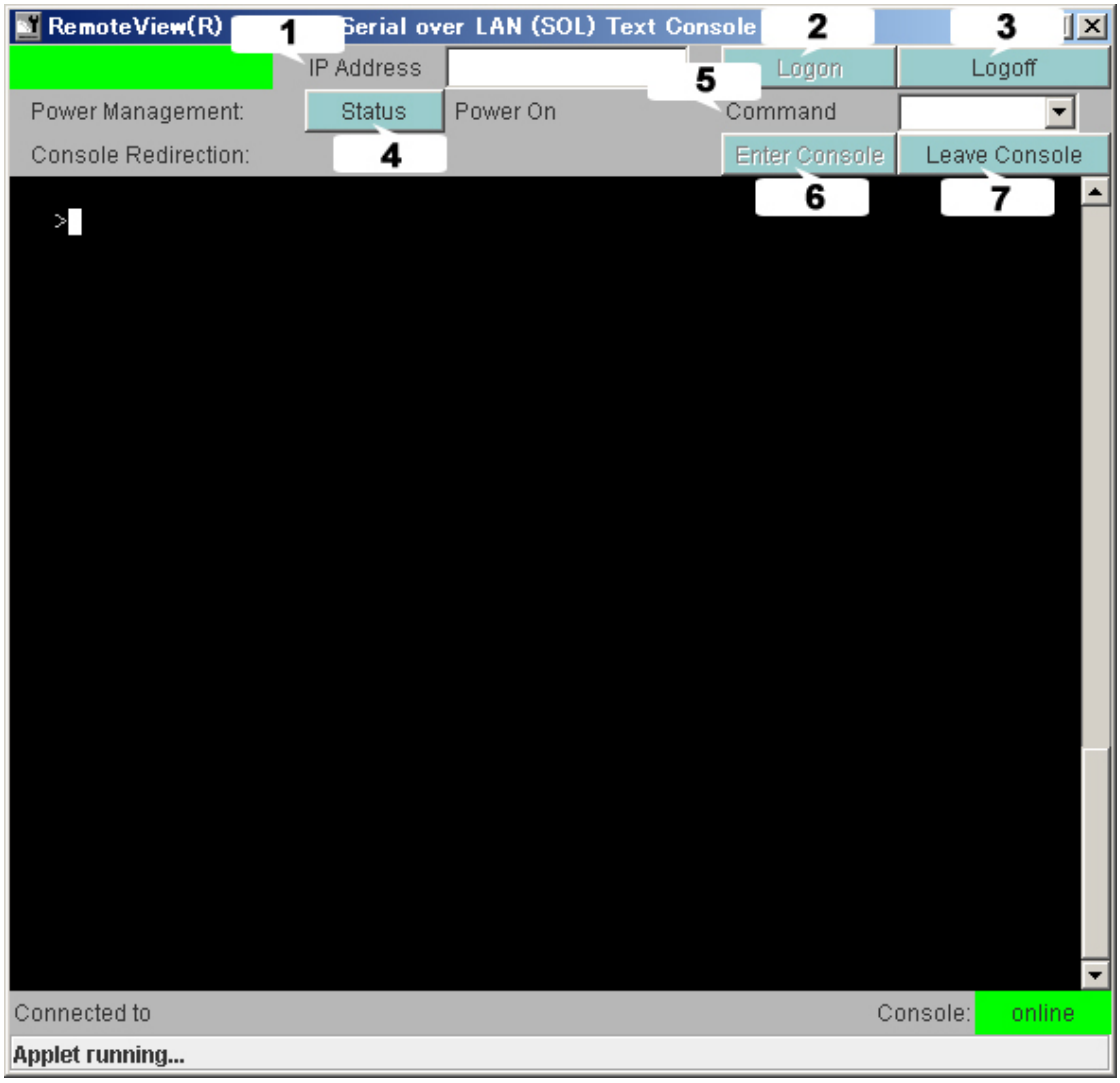


FIGURE 1.14 Connection diagram of text console redirection

The following shows the [Text Console Redirection] window.



No.	Item	Description
1	IP Address	Displays the IP address of the connection destination.
2	Logon	Connects to the server.
3	Logoff	Disconnects from the server.
4	Status	Displays the power status.
5	Command	Executes the power commands.
6	Enter Console	Connects to the console. (If another console redirection connection has already been established, clicking the [Enter Console] button will fail to establish a connection.)
7	Leave Console	Disconnects from the console.

FIGURE 1.15 [Text Console Redirection] window

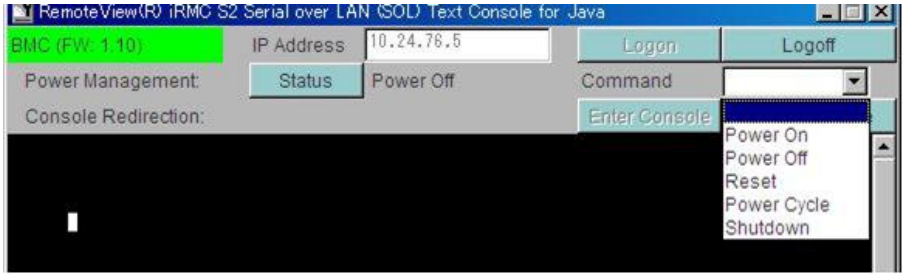


FIGURE 1.16 [Command] pull-down menu

The [Text Console Redirection] window supports the following command operations (pull-down menu operations):

TABLE 1.12 Commands in the [Text Console Redirection] window

Command name	Description
Power On	Turns on the power.
Power Off	Forcibly turns off the power irrespective of the state of the operating system.
Reset	Forcibly performs a reset irrespective of the state of the operating system.
Power Cycle	Forcibly turns off and on the power irrespective of the state of the operating system.
Shutdown	Sends a shutdown request to ServerView Agent. (If ServerView Agent has not been installed, the request does not result in a shutdown.)

Notes:

- Infrequently, the connection is cut (the window closes). If this occurs, wait a moment before trying to connect again. If "Console redirection already in use" is output when you try to connect again, wait up to 10 minutes before trying to connect again.
  While the text console redirection is connected, if the message [iRMC at <IP address> is no longer reachable. Please try later again] is output and the connection is cut off, the retried connection by pressing the Logon button may be cut off immediately. If it occurs, close the text console redirection window, and try a connection again.
- While the text console redirection is being used, a warning message indicating that the digital signature is expired may be displayed. This warning message does not affect the operation of Java Application. Click the [Execute] button. To avoid displaying this warning message every time the text console redirection is connected, check the check box for [Always trust content from this publisher], and click the [Execute] button.

The connection procedure is as follows.

1. Click the [Logon] button.

2. Enter values in [Username] and [Password] in the [ServerView Remote Management Frontend] window.

3. Click the [Login] button in the [ServerView Remote Management Frontend] window.

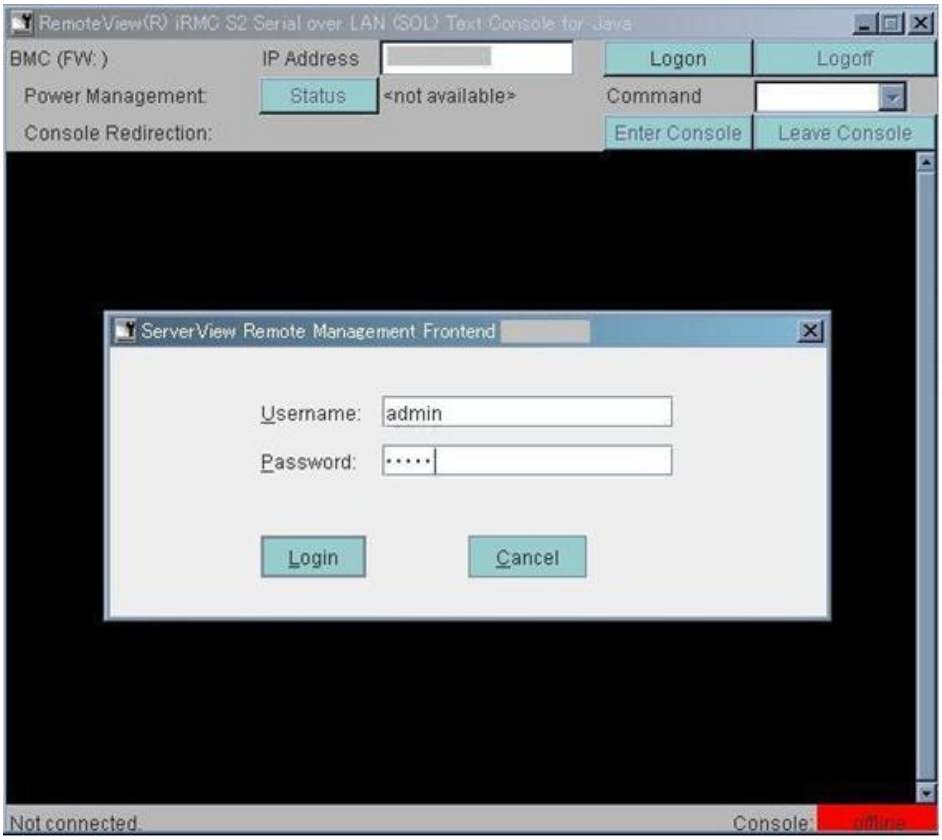


FIGURE 1.17 Text console redirection authentication window

Text console redirection via telnet

1. Use terminal software (such as Tera Term) to connect to the IP for text console redirection via telnet.

2. When the [Main Menu] window is displayed, press the [r] key.

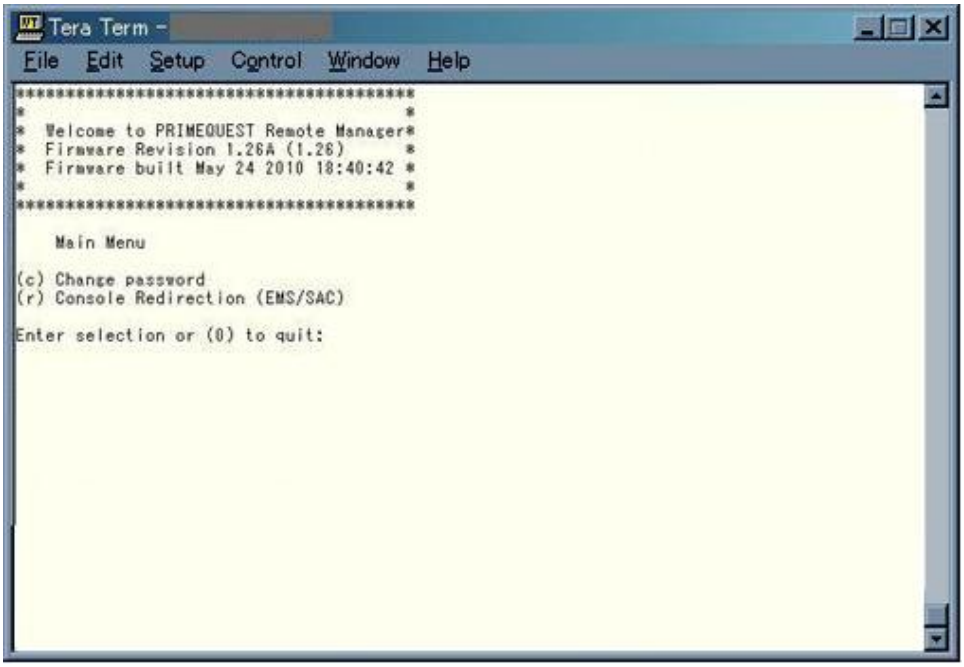

Tera Term -
File Edit Setup Control Window Help
Welcome to PRIMEQUEST Remote Manager
Firmware Revision 1.26A (1.26)
Firmware built May 24 2010 18:40:42
Main Menu
(c) Change password
(r) Console Redirection (EMS/SAC)
Enter selection or (0) to quit:

FIGURE 1.18 telnet connection for text console redirection

3. A connection for text console redirection is established.

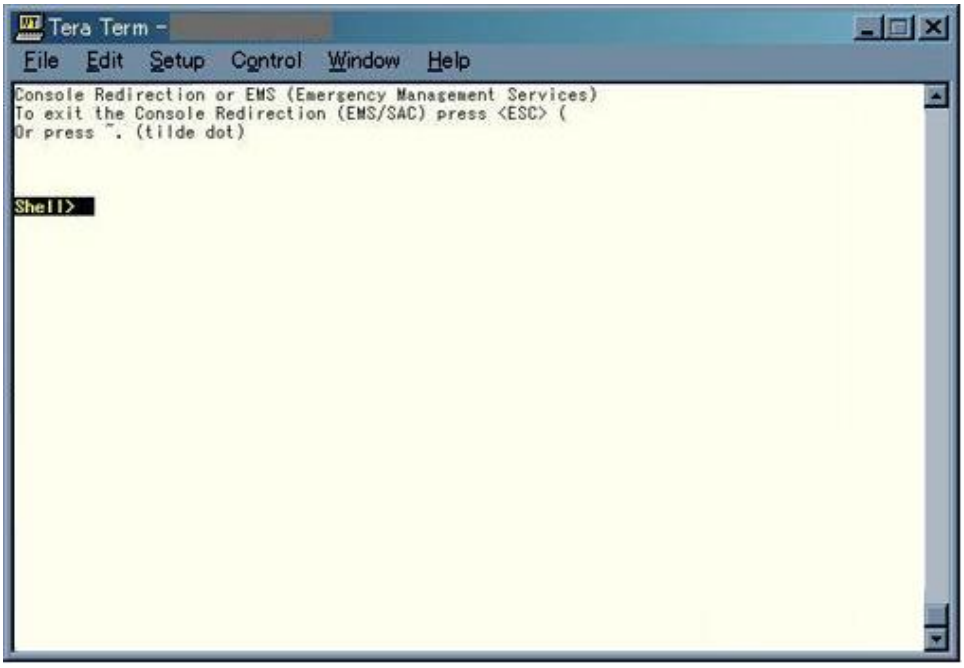

Tera Term -
File Edit Setup Control Window Help
Console Redirection or EMS (Emergency Management Services)
To exit the Console Redirection (EMS/SAC) press <ESC> (
Or press ~. (tilde dot)
Shell>

FIGURE 1.19 telnet connection for text console redirection (connection established)

Text console redirection via SSH

1. Use terminal software (such as Tera Term) to connect to the IP for text console redirection via SSH.
   (The following steps are the same as those for telnet.)

2. When the [Main Menu] window is displayed, press the [r] key.

3. A connection for text console redirection is established.

Forced disconnection of text console redirection

Note

The PRIMEQUEST 1800E has supported forced disconnection of text console redirection since version SA11021.
The PRIMEQUEST 1800E2 has supported it with all integrated firmware versions.

1. Only one user at a time is permitted to use the text console redirection function.
   If a user attempts to connect using the function while another user is using it, the message "Console Redirection already in use" appears. The window appears as follows.

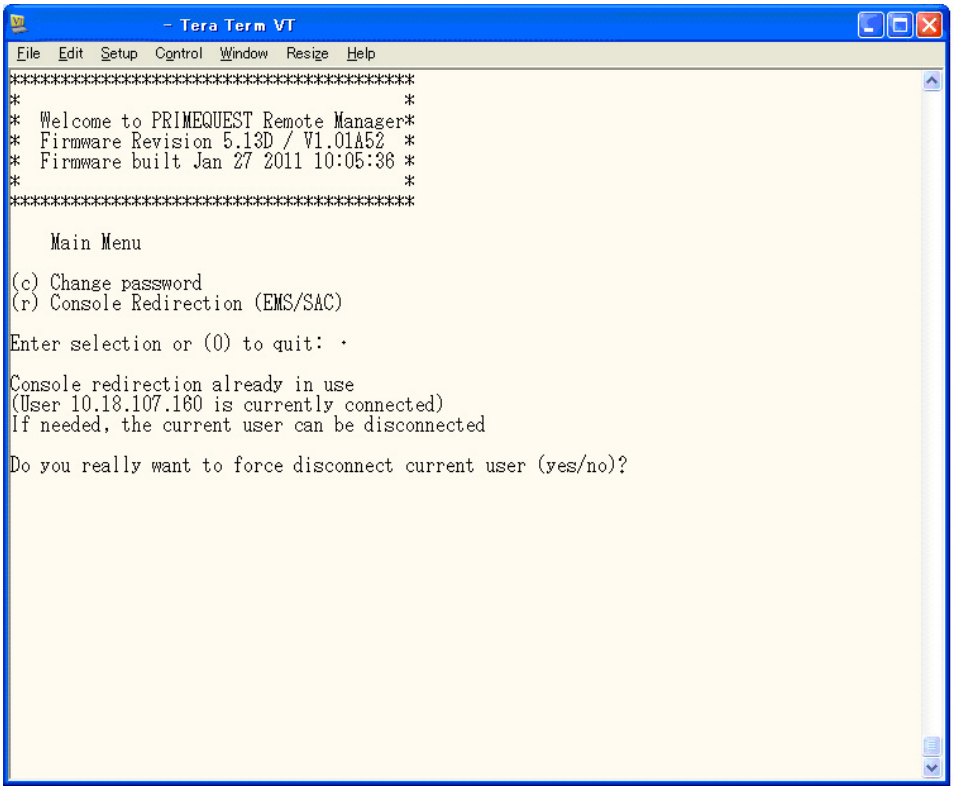

- Tera Term VT
File Edit Setup Control Window Resize Help
****
* Welcome to PRIMEQUEST Remote Manager*
* Firmware Revision 5.13D / V1.01A52 *
* Firmware built Jan 27 2011 10:05:36 *
****
Main Menu
(c) Change password
(r) Console Redirection (EMS/SAC)
Enter selection or (0) to quit:
Console redirection already in use
(User 10.18.107.160 is currently connected)
If needed, the current user can be disconnected
Do you really want to force disconnect current user (yes/no)?

FIGURE 1.20 Forced disconnection of text console redirection (1)

2. The window displays the IP address of the user currently using text console redirection. If the connection uses a proxy, the displayed IP address may not be correct. If the IP address is unknown, the message with the IP address does not appear.

   The yes/no selection enables you to disconnect the user currently using text console redirection.

   - Enter yes to go to the [Text Console Redirection] window in place of the current user. The terminal software of the disconnected user displays the following window.

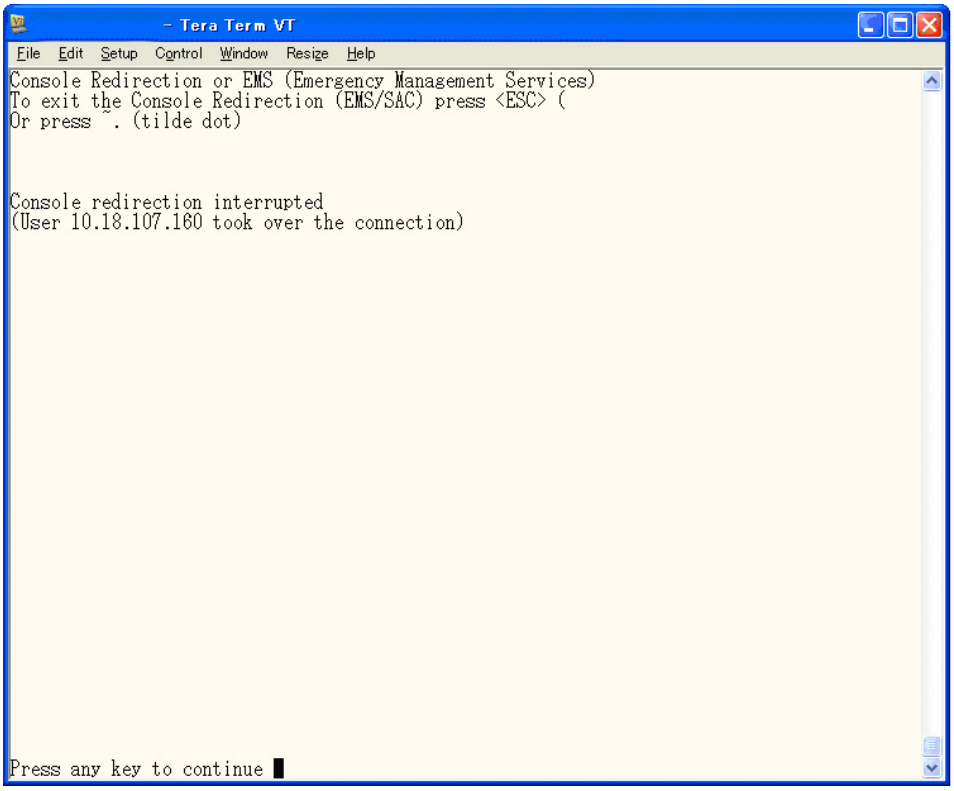

- Tera Term VT
File Edit Setup Control Window Resize Help
Console Redirection or EMS (Emergency Management Services)
To exit the Console Redirection (EMS/SAC) press <ESC> (
Or press ~. (tilde dot)
Console redirection interrupted
(User 10.18.107.160 took over the connection)
Press any key to continue

FIGURE 1.21 Forced disconnection of text console redirection (2)

- Enter no to return to the [Main Menu] window.

3. The window displays the IP address of the user who took over text console redirection. If the connection uses a proxy, the displayed IP address may not be correct. If the IP address is unknown, the message with the IP address does not appear.

4. Press any key to return to the [Main Menu] window.

Note

If a user is using text console redirection of the MMB from a Java applet when another user attempts access from terminal software via telnet or SSH, the same message "Console Redirection already in use" appears.
If the other user disconnects the Java applet user, the Java applet user cannot use text console redirection of the Java applet but is not notified of the disconnection.

Remote storage

The remote storage function enables a partition to share the CD/DVD drives, ISO images (CD/DVD), floppy disk drives, and USB devices of terminals as storage devices. ISO images and files on the terminal appear as emulated drives on the partition side.
Up to two devices can be used at the same time. When two devices are connected, one device uses USB 2.0, and the other uses USB 1.1. When only one device is connected, that device uses USB 2.0.

Notes

- For a terminal whose operating system is Windows Vista or Windows 7, set UAP (User Account Protection) to "Disable."

- If the operation terminal is accessing the USB memory (such as when the USB memory is open in Explorer), etc.), remote storage does not recognize this terminal as a connectable device.
- You may receive a STOP error message on a blue screen when using the remote storage function from your terminal.
  The blue screen appears on the terminal under the following circumstances.
  - You are using the remote storage function from a terminal running one of the following Windows operating systems:
    - Windows XP
    - Windows Vista
    - Windows 7
    - Windows Server 2003
    - Windows Server 2003 R2
    - Windows Server 2008
    - Windows Server 2008 R2
  - You are using two USB devices as remote storage devices.

  This issue does not occur when only one USB device is used.
  Example: One of your remote storage devices is a USB device and the other is an iso image.

  If your terminal is running Windows Vista or Windows Server 2008, you can avoid this issue by applying the hotfix from KB 974711. For details, see the Microsoft Knowledge Base.
  If your terminal is running Windows XP, Windows 7, Windows Server 2003, Windows Server 2003 R2, or Windows Server 2008 R2, use only one USB device.
  For more information related to Windows 7 or Windows Server 2008 R2, see the Microsoft Knowledge Base.

The following shows a diagram of the connection configuration for remote storage.

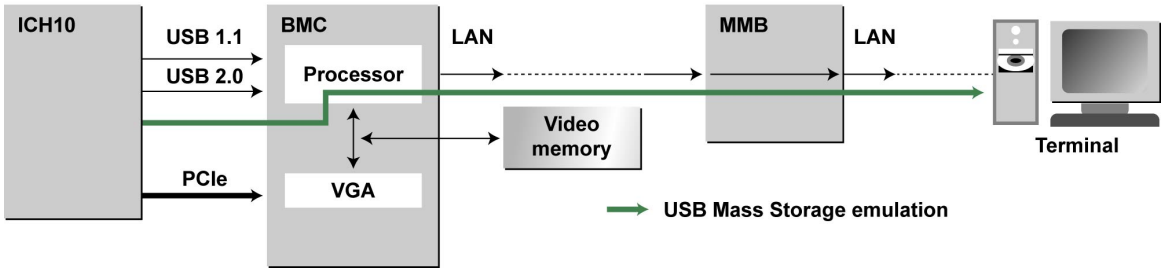


FIGURE 1.22 Connection configuration for remote storage

To recognize and display the devices that can be connected remotely, select [Remote Storage] from the [Remote Storage] menu in the [Video Redirection] window. To recognize CD drives and DVD drives as devices that can be connected remotely, the drives must already have media inserted in them.

FIGURE 1.23 Window with a remote storage list

The following lists the buttons available in the remote storage list window.

TABLE 1.13 Buttons available in the remote storage list window

Item	Description
Add	Adds an ISO image file as a remote storage target. The selected ISO image file will be recognized as a CD or DVD on the partition.
Connect / Disconnect	Connects the selected device to the server, or disconnects it from the server.
Remove	Clears the selection of a device selected as a remote storage target. If the selected device is connected with the server, this button is grayed out and inoperable. To disconnect the device and enable the button, click the [Disconnect] button.
Refresh	Scans and detects devices on the local machine again.
OK	Closes this window.

Remarks

When the [Video Redirection] window closes, all devices are disconnected from the server. Also, the devices are removed from the list.

Click the [Add] button to display the [Add Storage Device] dialog box. From the storage devices on the PC, you can select those to be connected to the partition.

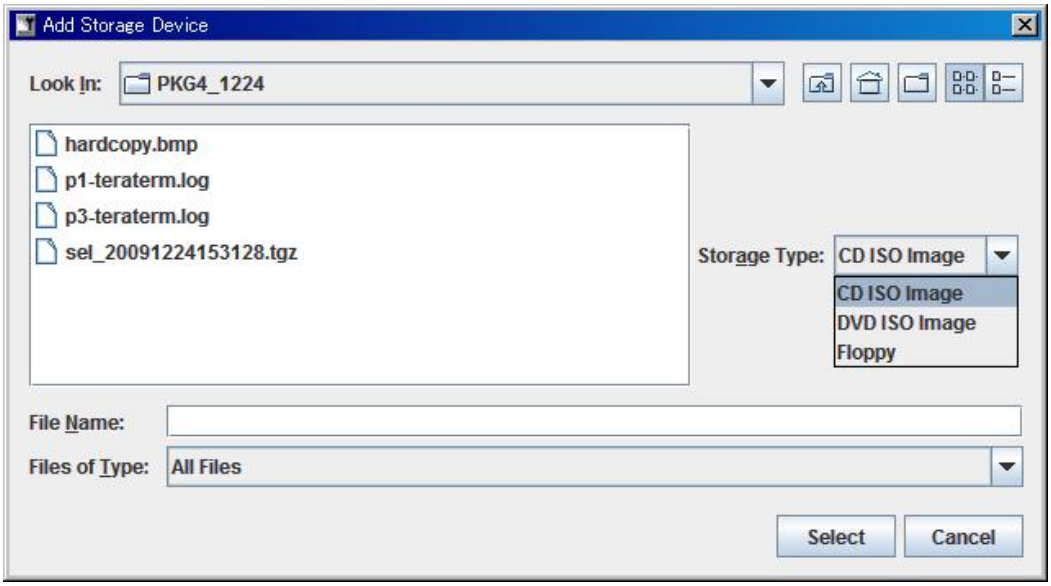


FIGURE 1.24 Remote storage selection window

The following lists the operable items in the remote storage selection window.

TABLE 1.14 Items in the remote storage selection window

Item	Description
[Browse]	Displays the current search location.
[File name]	Used to enter the device index letter (e.g., E:).
[File type]	Used to specify a file type.
Storage Type	Used to select the type of selected ISO image.
Select	Adds the selected device to the list.
[Cancel]	Closes this window.

Select the storage type, enter the file name, and click the [Select] button. Then, the display returns to the remote storage list window. From the remote storage list window, click the [Connect] button to connect the selected storage to the partition.

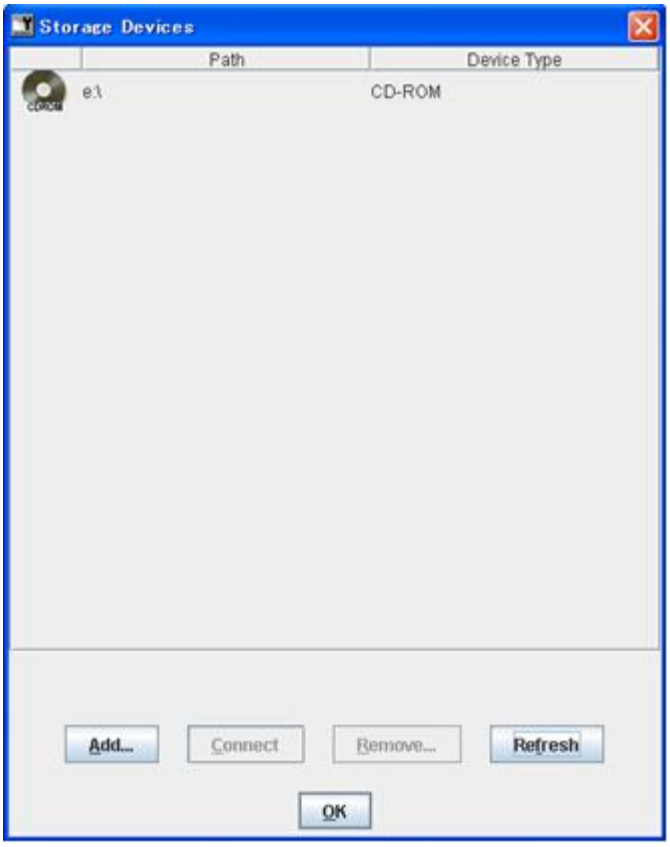


FIGURE 1.25 Window with a remote storage list

The following lists the storage types supported by remote storage.

TABLE 1.15 Supported storage types

Storage type	Description
CD ISO image	The partition side can use a CD ISO image on the PC terminal side.
DVD ISO image	The partition side can use a DVD ISO image on the PC terminal side.
Floppy disk	The partition side can use a floppy disk drive on the terminal side.

How to select USB 2.0 or USB 1.1

If the remote storage list has two selected devices when you click the [Connect] button, the USB 2.0/USB 1.1 selection dialog box appears.

FIGURE 1.26 USB 2.0/USB 1.1 selection dialog box

Click the [Swap] button to switch the USB settings of the two devices.

However, if only one device is selected when you click the [Connect] button, the dialog box does not appear. USB 2.0 is always selected in this case.

The following lists the buttons available in the USB2.0/USB1.1 selection dialog box.

TABLE 1.16 Buttons in the USB 2.0/USB 1.1 selection dialog box

Item	Description
OK	Closes the dialog box, and applies the modified settings.
Swap	Switches the USB 2.0/USB 1.1 setting.
Cancel	Closes the dialog box, and restores the settings.

Retrying a connection after the Reserved SB is switched

When changing the Home SB of the partition, connect text console and video redirection again.

1.6.4 ServerView Suite

ServerView Suite environment setup for Windows

For details on the environmental settings of ServerView Suite for Windows, see the *ServerView Suite ServerView Installation Manager*.

ServerView Suite environment setup for Linux

For details on the environmental settings of ServerView Suite for Linux, see the *ServerView Suite ServerView Installation Manager*.

Creating and managing server groups

For details on how to create and manage server groups for individual users, see the *ServerView Suite ServerView Operations Manager Server Management*.

CHAPTER 2 Operating System Installation (Link)

For details on how to install an operating system on a partition, see Chapter 4 Installing the Operating System and Bundled Software in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

CHAPTER 3 Component Configuration and Replacement (Addition and Removal)

This chapter describes the component configuration and how to replace components for the PRIMEQUEST 1000 series.

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3.2 High-availability Configuration 48
3.3 Replacing Components 61
3.4 Adding Components 72
3.5 Removing Components 77
3.6 Processes after Reserved SB Switching and an Automatic Partition Reboot 80

3.1 Partition Configuration

The partition configuration and partition operation requires one or more available SBs and one or more available LIOBs or LGSPBs.
A partition may not satisfy the above requirements at certain times, such as while configuration work is in progress. You can neither power on nor operate a partition that has no SB or does not otherwise satisfy the requirements. The SAS disk unit/SAS array disk unit and PCI_Box are not essential requirements for a partition.

The following lists partition configuration rules.

TABLE 3.1 Partition configuration rules (components)

Component	All models
SB	1 or more required (*1)
LIOB	1 or more of either required
LGSPB	
SAS disk unit/SAS array disk unit	Optional
LPCI_Box	Optional

*1 For details on the CPU mounting conditions, see APPENDIX G Component Mounting Conditions.

The criteria for combinations of the SB, LIOB, and LGSPB are as follows.

- For partition resources, the LIOB and LGSPB can be selected.
  However, the LGSPB requires the availability of the IOB connected to the GSPB to which the LGSPB belongs.
  For example, if IOB#0 is available, both LGSPB_0A and LGSPB_0B are available. If IOB#0 is not mounted or degraded, LGSPB_0A is unavailable even if it is mounted.
- The LIOB can be connected to any SB. There is no specific criteria on SB and LIOB combinations.
- The LGSPB is independent in terms of partition granularity, so there is no specific criteria on LIOB and LGSPB combinations.
- A partition configured with more than one SB (2 or more SBs) must use NTP.
- If an SB failure causes SB degradation and the Home SB is replaced, the operating system reads the RTC value of the new Home SB. This may result in a difference between the times before and after the Home SB replacement.

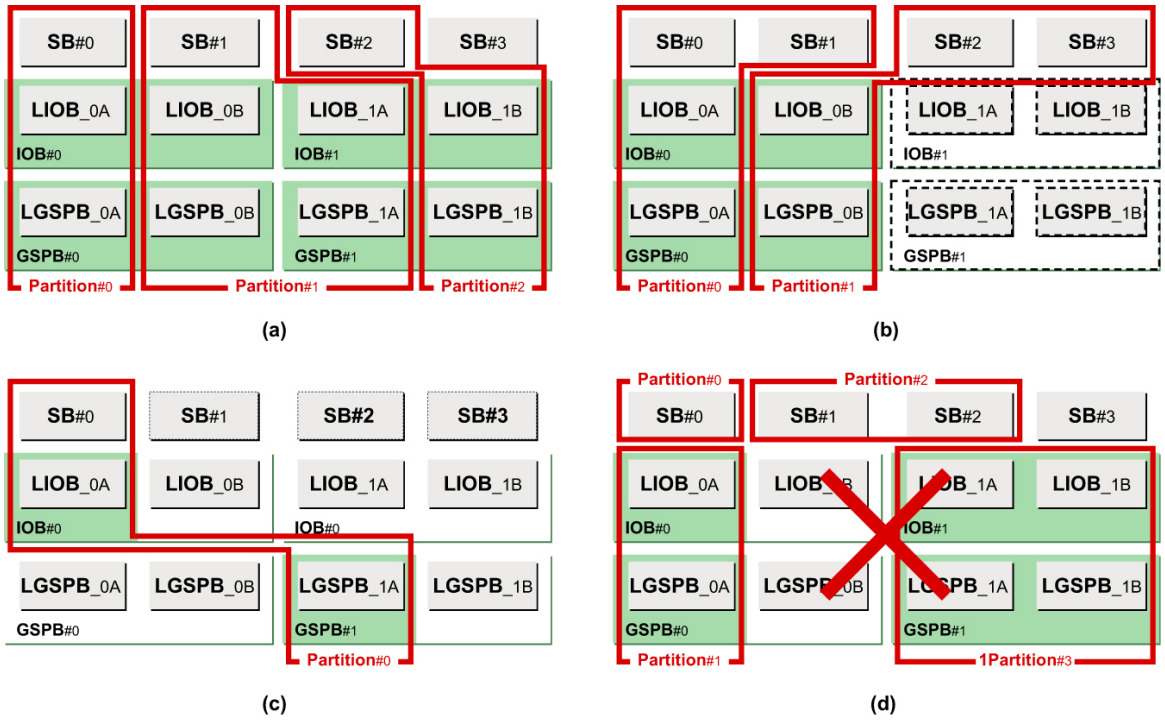
3.1.1 Examples of partition configurations

This section provides examples of partition configurations.

PRIMEQUEST 1800E2/1800E

The PRIMEQUEST 1800E2/1800E can have a configuration with up to four partitions. It can have a combination of any SB together with any LIOB and LGSPB.

The following shows examples of partition configurations. In the figure, components shown inside dotted lines or on a white background have not been mounted.



ID	Configuration example	Description
(a)	Partition configuration example 1 (Possible)	Here is an example with three partitions. Partition#1 contains 1 SB, 2 LIOBs, and 2 LGSPBs. Partition#2 contains 1 SB, 1 LIOB, and 1 LGSPB. Any combination of the SB and LIOB or LGSPB is possible.
(b)	Partition configuration example 2 (Possible)	Here is an example where two partitions are each configured with 2 SBs, 1 LIOB, and 1 LGSPB.
(c)	Partition configuration example 3 (Possible)	Combinations over the IOBs are possible, such as LIOB_0A and LGSPB_1A.
(d)	Partition configuration example 4 (Not possible)	No partition can consist only of an SB. Likewise, no partition can consist only of an LIOB and LGSPB.

FIGURE 3.1 Examples of partition configurations in the PRIMEQUEST 1800E2/1800E

3.1.2 Partition setup procedure using the MMB Web-UI

This section describes the partition setup procedure using the MMB Web-UI.

1. Stop the partition.
   >>See 1.3.1 [Power Control] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

2. Incorporate the SB, IOB, and GSPB into the partition.

>>See 1.3.4 [Partition Configuration] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

- Incorporate free SBs and GSPBs.
- Release and incorporate Reserved SBs.
- If no free SB or GSPB is available, remove an SB or GSPB from another existing partition and incorporate it into the partition.

3. Set the Home SB.

4. Set the Reserved SB as needed.
   >>See 1.3.5 [Reserved SB Configuration] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

5. Set the partition name.
   >>See 1.3.4 [Partition Configuration] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

6. Set various modes.
   >>See [Mode] window in 1.3.7 [Partition#x] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

7. Start the partition.
   >>See 1.3.1 [Power Control] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

3.2 High-availability Configuration

The PRIMEQUEST 1000 series supports the Reserved SB function and Memory Mirror function to implement high availability on the system. This section describes the Reserved SB function and the Memory Mirror function.

3.2.1 Reserved SB

The Reserved SB function can prepare spare SBs in the cabinet, automatically disconnect an SB that fails, restart the partition that incorporated the SB, and replace it with a spare SB. In particular, a spare SB intended for use as a replacement SB in case of failure is called a Reserved SB. All PRIMEQUEST 1000 series models support the Reserved SB function.

The Reserved SB function can provide the following advantages in cases of SB hardware failures:

- No decrease in SB resources, and quick recovery
- Capability to recover a single-SB partition from a failure (degradation)

The PRIMEQUEST 1000 series allows an SB in an active partition to be set as a Reserved SB. The function enables effective use of Reserved SBs.

The following shows an example of operation in which the SB in a test partition is employed as a Reserved SB. Here, an SB failure occurs in the partition that is the system for actual operation. Then, firmware issues a shutdown command to the test partition. After the shutdown sequence is completed, the SB in the test partition is incorporated into the system for actual operation. However, this configuration can be applied only if permitted within the test partition shutdown period.

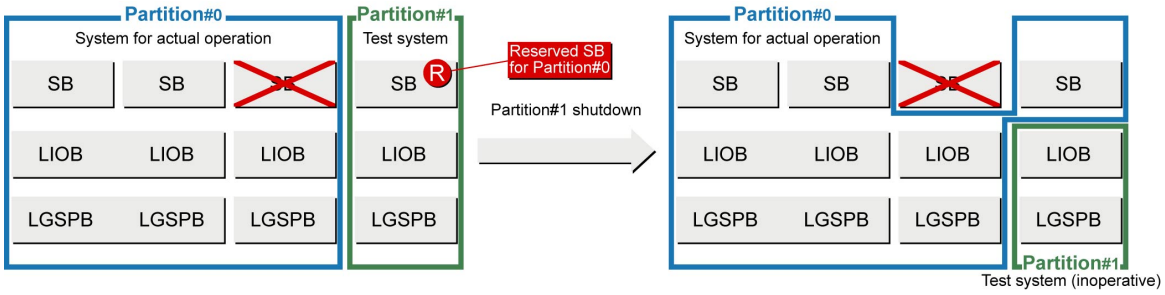


FIGURE 3.2 Example of operation where the SB in a test partition is a Reserved SB

Remarks

- Reserved SBs are intended for use in a hardware failure. Information from a memory dump is not intended for an investigation of the cause of a switch to a Reserved SB. To find the reason for a switch to a Reserved SB, reference the MMB system event log. Information from a memory dump is useful for an investigation of a software failure.
- At the first startup after switchover to a Reserved SB in a partition where Windows is installed, the partition must be restarted. Restart the partition as instructed.
- For a partition where Windows is installed, take account of the operation stoppage time for any SB failure and the time required for a restart. That restart time includes both the time taken for a reboot for the switching to the Reserved SB and the time taken for the initial startup. However, if you apply in advance a workaround that suppresses restarts in the case of a failure, you can limit the restarts to the one at the initial startup. For

details on the workaround, see Workaround for Windows restart in 3.4.3 Setting a Reserved SB in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

Reserved SB definition

The Reserved SB definition is cleared after a Reserved SB enters operation.

Note

In maintenance and restoration work after the Reserved SB enters operation, replace the faulty unit and specify the Reserved SB definition again with the Web-UI.

Reserved SB setting rules

The Reserved SB setting criteria are as follows.

- Any SB not belonging to a partition can be set as a Reserved SB.
- An SB can be set as a Reserved SB for multiple partitions.
- For a single partition, multiple Reserved SBs can be set.
- For a partition that consists of one SB, a Reserved SB with one mounted CPU or two mounted CPUs can be set.
- For a partition that consists of multiple SBs, a Reserved SB with only two mounted CPUs can be set.
- For a partition that consists of multiple SBs, only the SB that has the same CPU mounting conditions as the partition can be set as a Reserved SB. (*1)
- For a partition that consists of multiple SBs, only the SB that has the same DIMM mounting conditions as the partition can be set as a Reserved SB. (*1) (*2)

*1: Supported for SA11061and SB11062 or later. For SA11051 and SB11061 and earlier, even when a partition that consists of one SB, only the SB that has the same CPU mounting conditions or DIMM mounting conditions as the partition can be set as the Reserved SB for the partition.
*2: An SB that cannot use the Memory Mirror function can be set as a Reserved SB for a partition that uses the Memory Mirror function.

Notes on Windows

At the first startup after an SB is switched to the Reserved SB in a partition running Windows, the operating system may not start. Set Windows to automatically restart in the settings of the Reserved SB in the partition running Windows.For details on the settings, see 11.4.4 Setting up the dump environment (Windows) in the *PRIMEQUEST 1000 Series Administration Manual* (C122-E108EN). Check the [Automatically restart] check box shown in FIGURE 11.19 [Startup and Recovery] dialog box.
If the SB failure causes a suspension of business for the aforementioned reason, take into account the length of time required for the restart. The restart will take twice as long since one restart is needed after the switching to the Reserved SB and one restart for the subsequent initial startup.
However, the following workaround can suppress the restart request.

Workaround for the Windows restart

You can suppress the restart request only if the PRIMEQUEST 1000 series server has already set as the Reserved SB.
Repeat the following procedure for all the partitions with Windows Server OS installed.
Note that no message requesting a restart is displayed on the screen even if an SB failure occurs during switching to the Reserved SB.

1. After completing installation of the Windows Server OS, shut down the partition.

2. Remove the SB from the partition by using the MMB Web-UI. If the partition has multiple SBs mounted, you can remove any SB.
   For details, see Removing an SB, IOB, or GSPB in 3.4.1 Setting a partition configuration in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

3. Add an SB as the Reserved SB to the partition.
   For details, see Adding an SB, IOB, and GSPB in 3.4.1 Setting a partition configuration in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

4. Power on the partition. Then, start the Windows Server OS.

5. Log in with Administrator privilege. After the message that the system must be restarted is displayed on the screen, follow the instructions to restart the system.

6. After the Windows restart is completed, shut down the system.

7. Remove the SB incorporated as the Reserved SB in step 3 from the partition by using the MMB Web-UI.

8. Add the SB removed once in step 2 to the partition.

Notes on VMware

At the first startup after an SB is switched to the Reserved SB in a partition running VMware, the guest operating system may not start. Set the guest operating system to automatically restart and the BlueScreen Timeout item in the settings of the Reserved SB in the partition running VMware.

For example, to reset the ESX host 20 seconds after a panic occurs, set "20" for BlueScreenTimeout.

Remarks

To not reset the ESX host after a panic occurs, set "0" for BlueScreenTimeout.

How to set BlueScreenTimeout

Set BlueScreenTimeout from vSphere Client.

1. Open the [Configuration] tab of the host in vSphere Client. Click [Advanced Settings] in the [Software] pane.

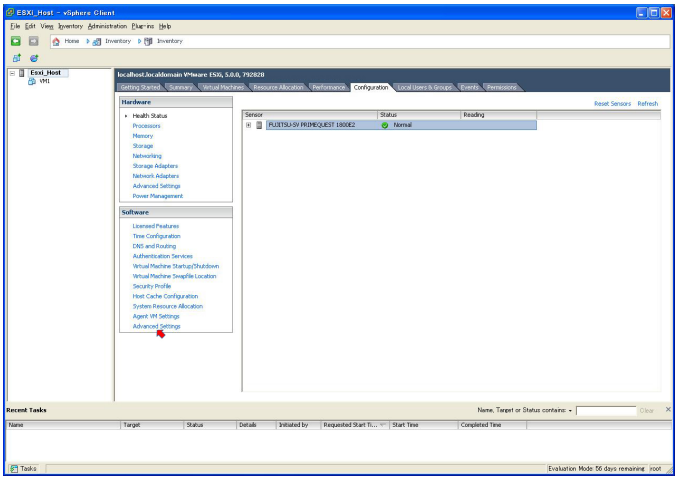


FIGURE 3.3 BlueScreenTimeout setting ([Configuration] tab)

2. The [Advanced] window opens. Click [Misc] in the left pane.
3. The right frame displays parameters. Set the BlueScreenTimeout value in [Misc. BlueScreenTimeout].

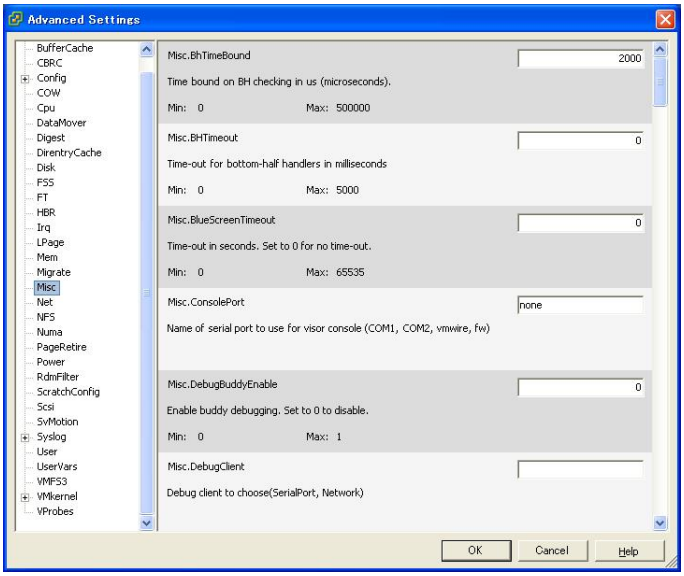


FIGURE 3.4 BlueScreenTimeout setting ([Misc] settings)

For details on the vSphere Client, see the manual of VMware.

Switching rules

The Reserved SB switching rules are as follows.

- Determining the switching source SB
  - If an SB has been configured as a Reserved SB for multiple partitions that experience simultaneous SB failures, the partition with the lower number takes priority for the SB switching (Example 1).
  - If multiple SBs in a partition fail, the SB with the lower SB number takes priority for switching (Example 2).
- Determining the switching destination SB
  - Among multiple Reserved SBs that have been set for a partition and do not belong to any partition, the Reserved SB with the highest SB number takes priority for switching (Example 3).
  - Among multiple Reserved SBs that have all been set for one partition and allocated to other partitions, the Reserved SB with the highest SB number in a partition that is powered off takes priority for

switching (Example 4). If all the partitions are powered on, the Reserved SB with the highest SB number takes priority for switching (Example 5).

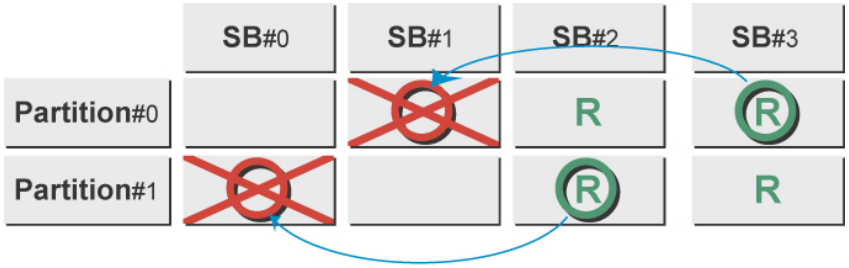
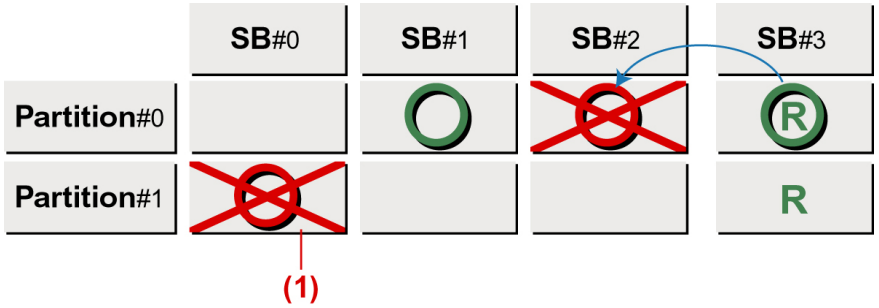


FIGURE 3.5 Example 1-a: Example with two SBs set as Reserved SBs in two partitions (SB#0 and SB#1 fail simultaneously)



No.	Description
(1)	No switching to the Reserved SB

FIGURE 3.6 Example 1-b: Example with one SB set as the Reserved SB in two partitions (SB#0 and SB#2 fail simultaneously)

No.	Description
(1)	No switching to the Reserved SB

FIGURE 3.7 Example 2: Example of multiple SBs failing in a partition

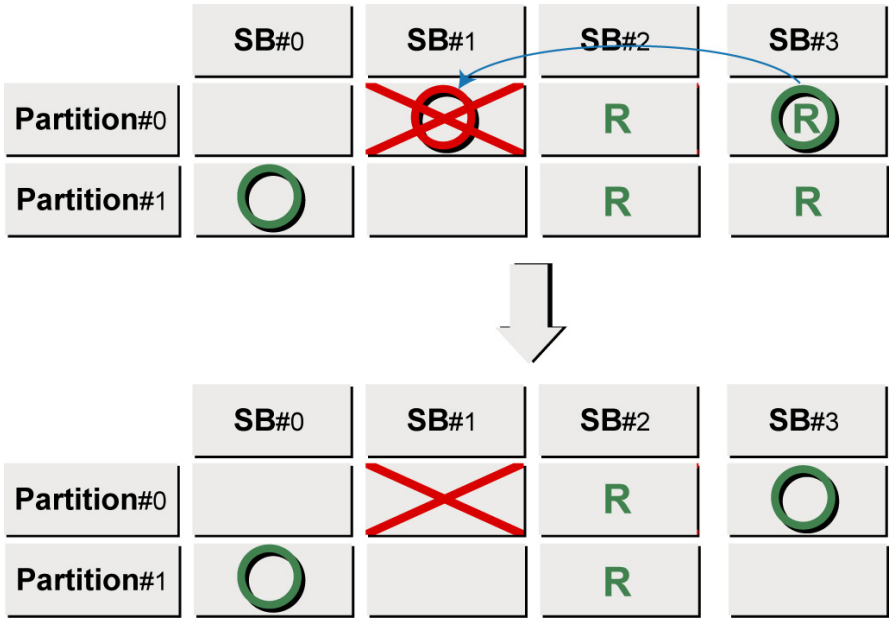


FIGURE 3.8 Example 3: Example with multiple free SBs (#2 and #3) set as Reserved SBs for Partition#0

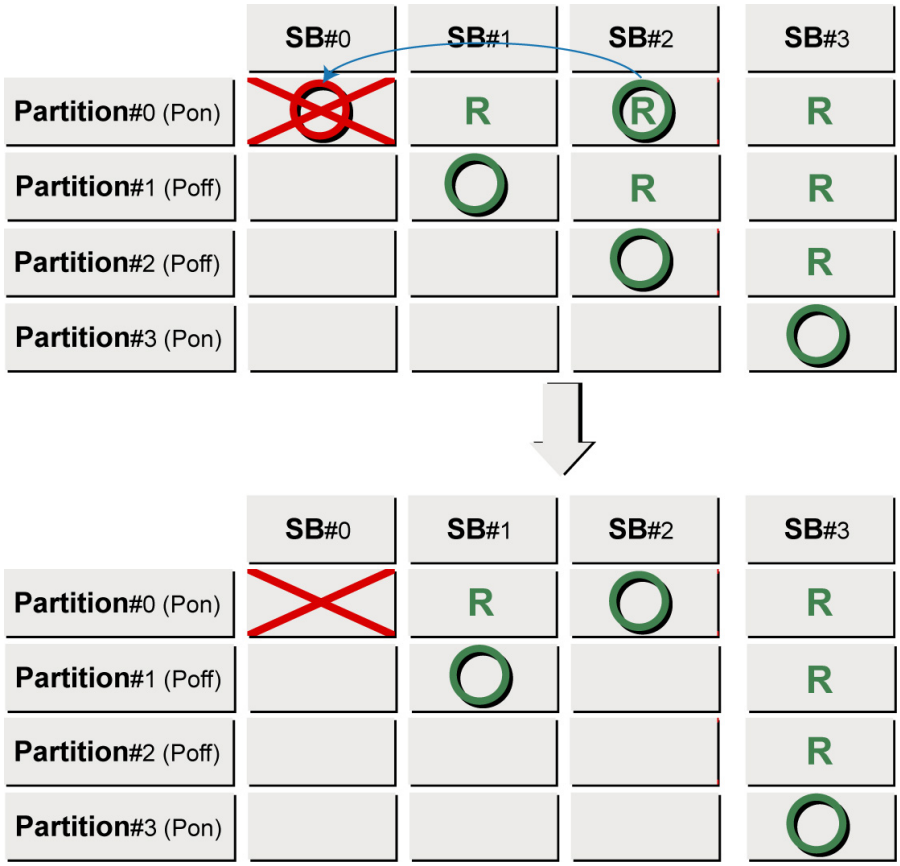


FIGURE 3.9 Example 4: Example where the Reserved SBs (#0, #1, and #2) for Partition#0 belong to other partitions

In Example 4, SB#1 and SB#2 in the powered-off partition are available. SB#2 has the higher SB number. SB#2 is selected as the switching destination SB.

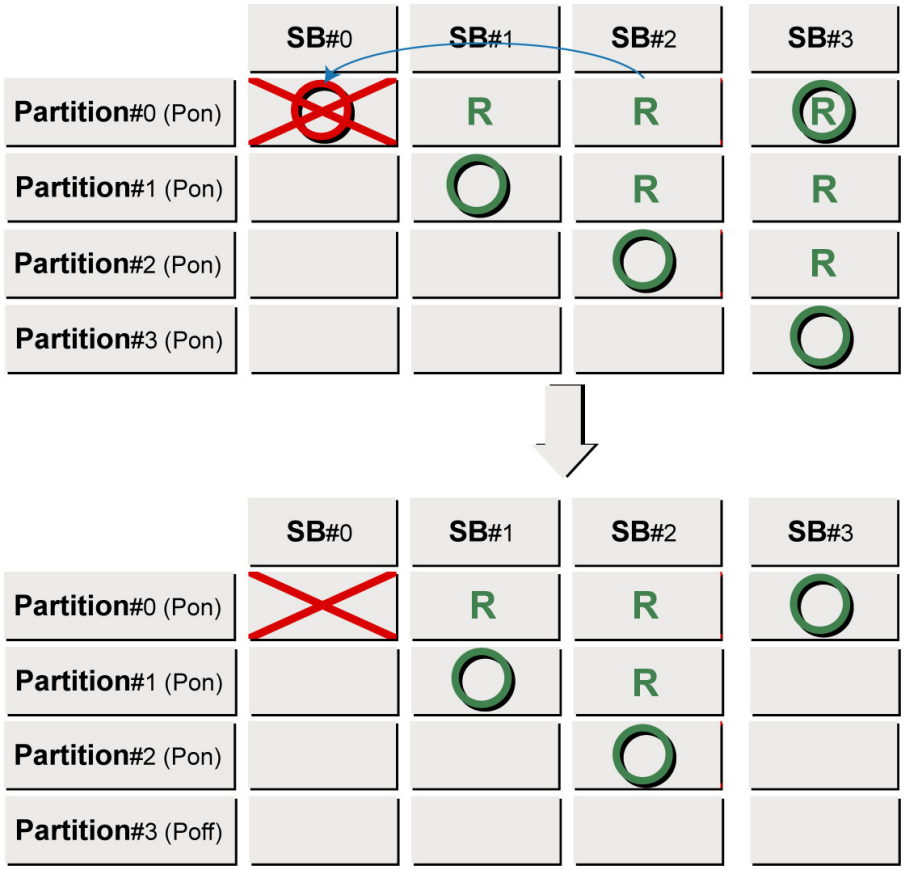
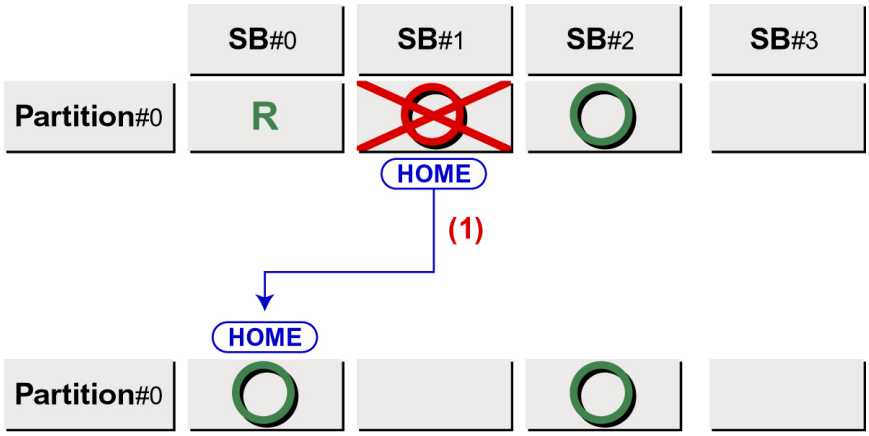


FIGURE 3.10 Example 5: Example where the Reserved SBs (#1, #2, and #3) for Partition#0 belong to other partitions

In Example 5, there is no SB in a powered-off partition. Among SB#1, SB#2, and SB#3 in the powered-on partitions, SB has the highest SB number. SB#3 is selected as the switching destination SB.

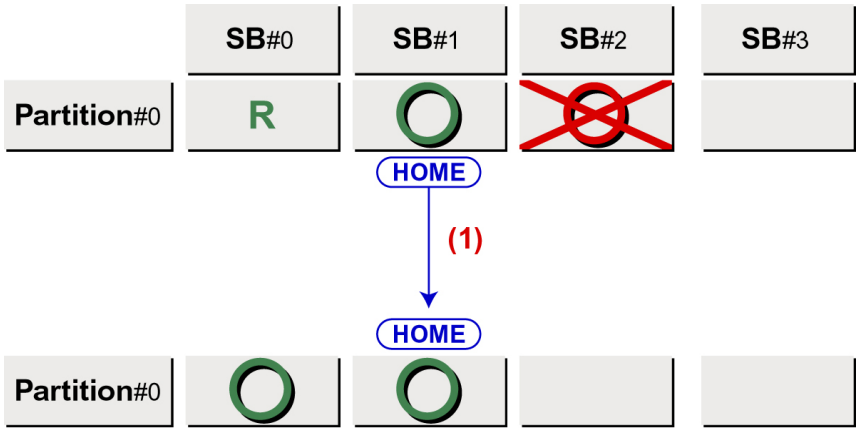
The following describes examples of switching the Home SB to a Reserved SB.

- In switching of the Home SB to a Reserved SB, the SB that becomes the Home SB has the lowest number among the Reserved SBs (Example 6).
- If an SB other than the Home SB is degraded, the Home SB does not change (Example 7).



No.	Description
(1)	Switching to SB#0 or SB#2 in the configuration of Partition#0. Since SB#0 has the lowest number, it becomes the Home SB.

FIGURE 3.11 Example 6: Example with SB#0 set as a Reserved SB (when the Home SB fails)



No.	Description
(1)	An SB other than the Home SB fails. The Home SB does not change.

FIGURE 3.12 Example 7: Example with SB#0 set as a Reserved SB (when an SB other than the Home SB fails)

Switching policy

The conditions (triggers) for switching to a Reserved SB are as follows.

The actual timing for switching to the Reserved SB is when the partition is started.

The descriptions here are conditions (triggers) for switching to a Reserved SB at the partition start time.

- SB degradation
- CPU degradation (including degradation of one CPU)
- DIMM degradation (including degradation of one pair of DIMMs)
- Detection of a Memory Mirror collapse
- Detection of QPI lane degradation
- Detection of SMI lane switchover

- Detection of PCI Express lane/speed degradation (IOH<=>IOB)

Remarks

Switching to the Reserved SB takes place even when the partition is automatically restarted. To automatically restart the partition, enter a value other than 0 for [Number of Restart Tries] on the [ASR Control] screen. For details on the [ASR Control] screen, see 9.4.1 Setting automatic partition restart conditions.

Switching to the Reserved SB set in a partition

The process for switching to the Reserved SB set in a partition is as follows.

- When the partition containing the Reserved SB is powered off, the SB is disconnected.
- When the partition containing the Reserved SB is powered on, firmware instructs the partition to power off.

However, after the firmware instructs the partition to power off, if 10 minutes elapse without the partition being powered off, it is assumed that the partition cannot be powered off. Then, the Force Power Off command is issued to forcibly power off the partition and to disconnect the SB.

Notes on Reserved SB function

- If an I/O device is connected to a USB port or VGA port of the Home SB, the connected I/O device needs to be reconnected manually after the Home SB is switched to a Reserved SB.
- After switching to a Reserved SB, the system is automatically restarted.
- When setting Reserved SBs, consider the priority of setting works to avoid a conflicting configuration. Do not set mutual dependence and loops although such settings are available under the configuration rules.
- If the memory capacity is expected to decrease after a switch to a Reserved SB, confirm that the decreased capacity will be within the allowable range for applications.
- The shutdown wait time for a switch to a Reserved SB being used by another partition is the value that is set from the MMB Web-UI (0 to 99 minutes). The default is 10 minutes. Only one shutdown wait time can be set for the system (in a cabinet). If the shutdown completes before the specified time elapses, the switching begins immediately. Set only a shutdown wait time that would be acceptable under the circumstances.
  - <For the SA11011 (MMB2.90) and earlier versions for the PQ1000 series>
    The maximum shutdown wait time for a switch to a Reserved SB being used by another partition is 10 minutes. Set only a shutdown wait time that would be acceptable under the circumstances.
- When setting Reserved SBs, be sure to use NTP for time synchronization at switching.
  - When using Linux, for the NTP setting, do not specify NTPDATE_OPTIONS = "-B" for the /etc/sysconfig/ntpd file.
  - When using Windows Server in the workgroup environment, execute the following procedure.
    1. Use [Date and Time] on the control panel or the w32tm command for NTP settings
       Example) w32tm /config /manualpeerlist: <time synchronization destination>
       For details, see Help displayed by executing the w32tm /? command.
    2. From the taskbar, start [Server manager].
    3. Select [Configuration] - [Service].
    4. From the service list, right-click [Windows Time] and select [Properties].
    5. For [Startup type] in the [General] tab, specify [Auto (Delay Start)].
    6. Click [OK] to close the dialog box.

  - When using VMware, use the NTP function in the guest operating system (Windows or Linux).
    When using the NTP function on the guest operating system (Windows or Linux), comply with the above rules.

Home SB switching method

Note the following specific connections in switching to a Reserved SB after a Home SB failure.

Note

After the switch to the Reserved SB, you may be asked for authentication of your license in the following cases:

- You are using a volume license or package product.
- The SB being used is not an SB that was purchased together with the enable kit.

TABLE 3.2 Notes on specific connections in switching to a Reserved SB

Port	Operational restriction
USB port	Any connection to a USB port of the Home SB must be manually reconnected to a USB port of the switched Reserved SB.
VGA port	Any connection to the VGA port of the Home SB must be manually reconnected to the VGA port of the switched Reserved SB.
Time setting	If NTP is not used, a time difference may arise after the switch to a Reserved SB, so the time must be checked and set from the OS.

Remarks

- The Reserved SB function can support only Flexible I/O mode.
  For an overview of Flexible I/O mode, see 5.6 Flexible I/O in the *PRIMEQUEST 1000 Series General Description* (C122-B022EN).
- After the switch to the Reserved SB, you may be asked for authentication of your license in the following cases:
  - You are using a Windows Server OS with a volume license or package product.
  - The SB being used is not an SB that was purchased together with the enable kit.

  For details, see License authentication with SB and enable kit combinations in 3.4 Adding Components.

3.2.2 Memory Mirror

The PRIMEQUEST 1000 series supports Memory Mirror by using CPU functions.
Enabling and disabling of Memory Mirror can be set from the MMB Web-UI. The default is Disabled.

Notes

- In maintenance and restoration after Memory Mirror is suspended because of CPU degradation, start Memory Mirror again. Note that after replacement of faulty parts, Memory Mirror remains off.
- Memory Mirror is suspended in only the following three cases.
  1. Memory Mirror is set for a partition that incorporates a Reserved SB and has a single SB configuration. Furthermore, the number of DIMMs mounted on the Reserved SB is not a multiple of 8.
  2. Memory Mirror has a 2-CPU/1-SB configuration. Furthermore, one CPU on SB#2 or SB#3 is degraded. (In this case, Memory Mirror is suspended irrespective of the number of DIMMs mounted.)
  3. Memory Mirror is set for a partition that incorporates a Reserved SB and has a single SB configuration. Furthermore, the Reserved SB is either SB#2 or SB#3, the partition has a 1-CPU/1-SB configuration,

and the Reserved SB is switched with a faulty SB. (In this case, Memory Mirror is suspended irrespective of the number of DIMMs mounted.)

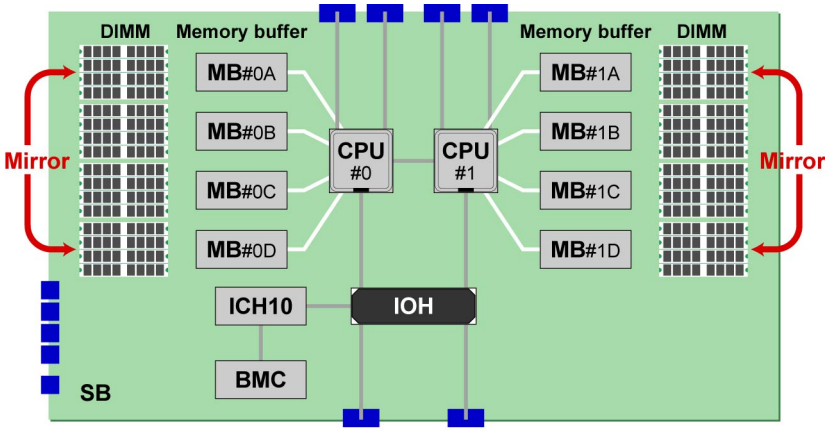
- For the PRIMEQUEST1800E2/1800E, Memory Mirror can be used with a single-CPU configuration only for SB#0and SB#1, not for SB#2 and SB#3.

Memory Mirror operations

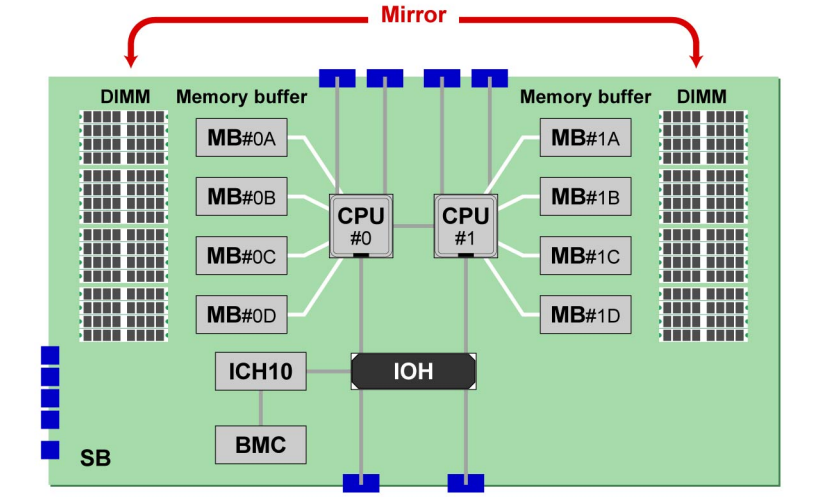
Memory Mirror is valid only for the memory modules on the same SB. Memory Mirror cannot be used between memory modules on different SBs.

There are two types of Memory Mirror operation: Mirroring within CPU and Mirroring between CPUs. The operation modes are automatically set in the PRIMEQUEST 1000 series models.

- Mirroring within CPU is set on the PRIMEQUEST 1800E2/1800E (SB#0 and SB#1). It takes effect for an SB with one mounted CPU.
- Mirroring between CPUs is set on the PRIMEQUEST 1800E2/1800E. The mirroring operation is between the DIMMs controlled by two CPUs on the same SB. If only one CPU is mounted on the SB, Memory Mirror cannot be set.



(a)



(b)

Letter	Mirror
(a)	Mirroring within CPU

Letter	Mirror
(b)	Mirroring between CPUs

FIGURE 3.13 Mirroring within CPU and Mirroring between CPUs

The following lists the supported mirroring operations by model and configuration.

TABLE 3.3 Mirroring operations by model and configuration

Model and configuration		Mirroring operation
PRIMEQUEST 1800E2/1800E	1 CPU SB#0, #1 (partition)	Mirroring within CPU
	1 CPU SB#2, #3 (partition)	Not supported
	2 CPU SB (partition)	Mirroring between CPUs

Memory Mirror conditions

The following lists Memory Mirror conditions.

TABLE 3.4 Memory Mirror conditions

Mirroring operation	Mirroring condition
Mirroring within CPU	Mount DIMMs according to G.2.1 DIMM mounting sequence.
Mirroring between CPUs	Mount DIMMs according to G.2.1 DIMM mounting sequence. In partitions configured with multiple SBs, the memory modules must be configured independently on the SBs (added by SB).

Also, about the hardware, the DIMM groups used for mirroring must have the same capacity.

Note

On the PRIMEQUEST 1800E2/1800E, the DIMM mounting locations for Memory Mirror with one CPU are different from those for Memory Mirror with two CPUs. For details on the DIMM mounting conditions, see G.2 DIMM.

3.2.3 Hardware RAID

The PRIMEQUEST 1000 series supports Hardware RAID.
Hardware RAID is handled by a dedicated RAID controller chip and firmware. The PCI Express card serves to control the array (faulty HDD disconnection, installation, and LEDs).

Hardware RAID for the PRIMEQUEST 1000 series supports RAID 0, 1, 1E, 5, 6, and 10.

The SAS array disk unit has a space dedicated for the BBU (battery backup unit). Together with the SAS array controller card, installation of a SAS array disk unit with a BBU mounted (battery backup feature) enables the write-back cache, which improves write performance in the RAID configuration.

For details on the Hardware RAID configuration, see the *ServerView RAID Management User Manual*.
For details on hard disk replacement in a Hardware RAID configuration, see 4.3 Replacing Hard Disks in a Hardware RAID Configuration.

Notes

- Hardware RAID and Software RAID (GDS) are mutually exclusive in one partition.
- To use Hardware RAID, consider either of the following requirements to protect your data in the event of a power failure:
  - A BBU is mounted
  - Appropriate means, such as a redundant power supply, dual-system power reception mechanism, CVCF, and UPS, are used to secure a margin for the AC power supply.

3.2.4 ServerView RAID

For details on ServerView RAID, see the *ServerView RAID Management User Manual*.

3.3 Replacing Components

You can identify the components to be replaced, by looking at the LEDs. The boards to be replaced and the operation panel have these LEDs. For details on the LEDs, see APPENDIX F Status Checks with LEDs.

3.3.1 Replaceable components

The following lists the replaceable components and replacement conditions.

TABLE 3.5 Replaceable components and replacement conditions

Component name		AC power off (cold system)	AC power on All partitions off (hot-system cold-partition maintenance)	AC power on Target partition off (hot-system cold-partition maintenance)	AC power on Target partition on (hot maintenance)
PSU (*1)		Replaceable	Replaceable	Replaceable (*2)	Replaceable (*2)
FAN (*1)		Replaceable	Replaceable	Replaceable	Replaceable
SB		Replaceable	Replaceable	Replaceable	Not replaceable
SB	VRM (*3)	Replaceable	Replaceable	Replaceable	Not replaceable
	CPU (*3)	Replaceable	Replaceable	Replaceable	Not replaceable
	DIMM (*3)	Replaceable	Replaceable	Replaceable	Not replaceable
	BATTERY (*3)	Replaceable	Replaceable	Replaceable	Not replaceable
IOB		Replaceable	Replaceable	Replaceable (*4)	Not replaceable
IOB	PCI Express card	Replaceable	Replaceable	Replaceable	Replaceable (*1, *5, *6, *12)
GSPB		Replaceable	Replaceable	Replaceable (*4)	Not replaceable
SAS disk unit (*7)		Replaceable	Replaceable	Replaceable	Not replaceable
SAS disk unit	HDD	Replaceable	Replaceable	Replaceable	Replaceable (*1)
SAS array disk unit	BBU (*8)	Replaceable	Replaceable	Replaceable	Not replaceable
	HDD	Replaceable	Replaceable	Replaceable	Replaceable
MMB (*9)		Replaceable	Replaceable (*9)	Replaceable (*9)	Replaceable (*9)

Component name			AC power off (cold system)	AC power on All partitions off (hot-system cold-partition maintenance)	AC power on Target partition off (hot-system cold-partition maintenance)	AC power on Target partition on (hot maintenance)
MMB	Battery		Replaceable	Replaceable (*9)	Replaceable (*9)	Replaceable (*9)
DVD board			Replaceable	Not replaceable	Not replaceable	Not replaceable
DVD drive (*10)			Replaceable	Replaceable	Replaceable	Replaceable (*11)
PCI_Box			Replaceable	Replaceable	Replaceable (*4)	Not replaceable
PCI_Box	IO_PSU		Replaceable	Replaceable	Replaceable (*2)	Replaceable (*2)
	IO_FAN		Replaceable	Replaceable	Replaceable	Replaceable
	PEXU		Replaceable	Replaceable	Replaceable	Not replaceable
	PEXU	PCI Express card	Replaceable	Replaceable	Replaceable	Replaceable (*1, *5, *6, *12)

*1 This is possible only if the system is duplicated. Redundancy software is required.

*2 This is when the PSU redundant configuration is used.

*3 The SB will need to be removed.

*4 The LGSPB, LIOB, and LPCI_Box in a partition share physical hardware. Therefore, the partition using the components needs to be shut down. Before IOB replacement, the partitions using the GSPB must be shut down.

*5 The PCI Hot Plug function is required.

*6 Replacing the boot path is not possible with hot replacement.

*7 One SAS disk unit or SAS array disk unit and one SAS card or SAS array controller card make one set of maintenance parts. Replacing only the card is not possible.

*8 The SAS disk unit will need to be removed.

*9 This is possible only if the MMB is duplicated.

*10 Replace only the DVD drive without removing the DVDB.

*11 The connections to all partitions must be disconnected (free) before replacement.

*12 Hot maintenance of a converged network adapter (CNA) or a 785 GB/1.2 TB internal solid-state drive that uses a PCI slot is not possible. Stop the partition before the replacement.

Remarks

VMware does not support hot replacement of HDD and PCI cards.

3.3.2 Component replacement conditions

This section describes the replacement conditions of each component.

PSU

The PSU can be replaced while the system continues operating. PSU replacement in a non-redundant configuration requires the system to be stopped.

Fan unit

The fan unit can be replaced while the system continues operating.

SB

The SB can be replaced while the power is off to the partition containing the SB.

Remarks

Each DIMM, CPU, battery, internal USB, and VRM module mounted on the SB can be replaced after the SB is physically removed.

Note

If NTP is not used, set the time from the operating system because a time difference may arise after the Home SB is replaced.

IOB

The IOB can be replaced while the power is off to all partitions to which the IOB and the GSPB connected to the IOB belong.

GSPB

The GSPB can be replaced while the power is off to all partitions to which it belongs.

Remarks

- After replacing the GSPB, set WOL for a new NIC from the operating system.
- In Linux, after replacing the GSPB, set the hardware address (MAC address) again. For details on how to set it again, contact your sales representative or a field engineer.
- For PXE boot, after replacing the GSPB, the boot order must be reconfigured.
  For details on how to reconfigure it, see 5.4.2 Overview of UEFI boot specifications in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

SAS disk unit/SAS array disk unit

One SAS disk unit or SAS array disk unit and one SAS card or SAS array controller card make one set of maintenance parts. (Replacing only the card is not possible.) The HDD can be replaced without removal of the unit. For the hot replacement procedure for hard disks, see CHAPTER 4 Hot Replacement of Hard Disks. For the BBU replacement procedure, see 3.3.5 Replacing the battery backup unit of an array controller card .

MMB

In a system with two MMBs installed, hot replacement can be used to replace an MMB during system operation. Since a faulty MMB would presumably have been switched with the standby MMB, simply replace the faulty MMB

(standby MMB). To replace the active MMB, switch it with the standby MMB before replacing it. The replacement does not affect control and monitoring in the system.

DVD drive

The DVD drive can be replaced while the system continues operating. However, from the viewpoint of the system, the replacement appears to be the removal and addition of a USB device. For this reason, the DVD drive must be disconnected from all partitions before replacement.

3.3.3 Replacement procedures in hot maintenance

This section describes the procedures before and after replacement in hot maintenance.

Procedure before replacement

Stop the relevant partition according to 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

Procedure after replacement

See 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

3.3.4 Replacement procedures in cold maintenance

This section describes the procedures before and after replacement in cold maintenance.

Procedure before replacement

Stop all partitions.

Procedure after replacement

Start the relevant partition.

3.3.5 Replacing the battery backup unit of an array controller card

This section describes the procedure for replacing the BBU (battery backup unit) on an array controller card. The array controller card BBU should be replaced regularly. RAS Support Service monitors its life cycle.
RAS Support Service provides life-cycle monitoring and sends messages for the following notification.

TABLE 3.6 Replacement notification messages of RAS Support Service (BBU)

Start time for sending messages for advance notification of replacement	Message sending time for replacement notification
After about 2 years from the start of use or replacement of the battery	After about two years

For details on the RAS Support Service, see the *RAS Support Service User's Guide*.

Replacing the BBU

The BBU replacement workflow is described below.

1. Start ServerView RAID Manager.

2. ServerView RAID Manager checks the hard disks for any failure. If a hard disk is faulty, replace it.

3. Power off the partition. Then, ask a field engineer to take over the procedure.
   * A field engineer performs the following steps 4 and 5.

4. Remove the array controller card from the SAS array disk unit.

5. Replace the array controller card BBU. Then, attach the array controller card onto the SAS array disk unit.

6. Take over the procedure from the field engineer. Start the partition. Then, start the operating system.

7. BBU recalibration automatically begins. Confirm that the following event is logged. In Windows, the event is logged in the event log (SYSTEM). In Linux, it is logged in the system log.

   TABLE 3.7 Event log at recalibration

Source	ServerView RAID
Type	Informational
Event ID	10304
Description	RAID_Card#xx: BBU relearn started

8. Display the GUI of RAS Support Service.

9. On the list of service life components, check for the name of the array controller card whose BBU was replaced, as shown in e-mail or the PSA Agent log. Then, update the mounting date of the battery (RAID_Card#XX) to the replacement date.

10. Stop RAS Support Service.

For details on how to start ServerView RAID Manager or BBU life-cycle management and other task settings, see the *ServerView RAID Management User Manual*.

Remarks

If the replacement battery level is considerably low, the following two events may occur at the same time and the battery may remain undetected. In this case, keep the system operating continuously for at least 60 minutes to charge the battery. After the battery is charged, it is normally detected at the next restart.

TABLE 3.8 Event log when the battery level is low (1)

Source	ServerView RAID
Type	Informational
Event ID	10298
Description	RAID_Card#xx: BBU present

TABLE 3.9 Event log when the battery level is low (2)

Source	ServerView RAID
Type	ERROR
Event ID	10314
Description	RAID_Card#xx: BBU removed

3.3.6 Replacing the battery unit of a UPS (uninterruptible power supply)

This section describes the procedure for replacing the UPS battery unit. The UPS battery unit should be replaced regularly. RAS Support Service monitors its life cycle.
RAS Support Service provides life-cycle monitoring and sends messages for the following notification.

TABLE 3.10 Replacement notification messages of RAS Support Service (UPS)

Start time for sending messages for advance notification of replacement	Message sending time for replacement notification
About 1 year and 9 months from the start of use or replacement of the battery	After about two years

For details on the RAS Support Service, see the *RAS Support Service User's Guide*.

Replacing the battery unit

The battery unit replacement flow is described below.

1. Stop the entire system. Then, ask a field engineer to perform step 2.
   * A field engineer performs step 2.

2. Replace the UPS battery unit.

3. Take over the procedure from the field engineer. Display the GUI of RAS Support Service on the partition under the UPS battery unit life cycle monitoring.

4. On the list of service life components, update the mounting date of the UPS (battery) to the replacement date.

5. Stop RAS Support Service.

3.3.7 Replacing an internal solid-state drive that uses a PCI slot

This section describes the procedure for replacing an internal solid-state drive that uses a PCI slot (a 785 GB/1.2 TB internal solid-state drive).

Note

Hot replacement of an internal solid-state drive that uses a PCI slot is not supported. Stop the partition before the replacement.

In a RAID configuration (LINUX software RAID)

1. Place the faulty PCI card offline, and remove the card.

```
(Example) # mdadm /dev/md0 --fail /dev/fiob
(Example) # mdadm /dev/md0 --remove /dev/fiob
```

2. Power off the partition.
   For details on powering off partitions, see 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

3. Replace the faulty PCI card.

4. Power on the partition.
   For details on powering on partitions, see 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

5. Format the replacement PCI card.
   Use the following procedure.
   1. fio-detach (Disconnecting the device from the operating system)
   2. fio-format (Low-level formatting of the device)
   3. fio-attach (Making the device available on the operating system)

```
(Example) # fio-detach /dev/fct1
(Example) # fio-format /dev/fct1
(Example) # fio-attach /dev/fct1
```

   Remarks

   For details on each command, see the *ioMemory Product Family User Guide (Linux) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
   http://jp.fujitsu.com/platform/server/primequest/download-e/

6. Add the device.
   Remarks

   The work of adding the device will trigger the rebuild operation.

```
(Example) # mdadm /dev/md0 --add /dev/fiob
```

In a RAID configuration (Windows software RAID)

1. Place the faulty PCI card offline, and remove the card.
   Select the appropriate volume from [Disk Management] in Windows, and execute [Remove Mirror].

2. Power off the partition.
   For details on powering off partitions, see 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

3. Replace the faulty PCI card.

4. Power on the partition.
   For details on powering on partitions, see 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

5. Format the replacement PCI card.
   Use the following procedure. (Execute commands from the command prompt.)
   1. fio-detach (Disconnecting the device from the operating system)
   2. fio-format (Low-level formatting of the device)
   3. fio-attach (Making the device available on the operating system)

```
(Example) # fio-detach /dev/fct1
(Example) # fio-format /dev/fct1
(Example) # fio-attach /dev/fct1
```

   Remarks
   For details on each command, see the *ioMemory Product Family User Guide (Microsoft Windows) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
   http://jp.fujitsu.com/platform/server/primequest/download-e/

6. Add the device.
   Select the appropriate volume from [Disk Management] in Windows, and execute [Add Mirror].
   Remarks
   The work of adding the device will trigger the rebuild operation.

In a SWAP configuration (Linux configuration)

1. Delete the swap entry for the faulty PCI card.

```
(Example) # swapoff /dev/fioa1
```

2. Confirm the serial number of the faulty PCI card.
   For the procedure to confirm the serial number, see the *ioMemory Product Family User Guide (Linux) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
   http://jp.fujitsu.com/platform/server/primequest/download-e/

3. Delete the serial number of the PCI card from preallocate_memory in /etc/modprobe.d/iomemory-vsl.conf.
   Note

Before replacing the PCI card, delete the serial number of the faulty PCI card from preallocate_memory in /etc/modprobe.d/iomemory-vsl.conf.
For details, see the *ioMemory Product Family User Guide (Linux) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
http://jp.fujitsu.com/platform/server/primequest/download-e/

4. Power off the partition.
   For details on powering off partitions, see 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

5. Replace the faulty PCI card.

6. Power on the partition.
   For details on powering on partitions, see 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

7. Format the replacement PCI card.
   Use the following procedure.
   1. fio-detach (Disconnecting the device from the operating system)
   2. fio-format (Low-level formatting of the device)
      Remarks
      If the device is used as a swap device, the formatting must have a 4K sector size.
   3. fio-attach (Making the device available on the operating system)

```
(Example) # fio-detach /dev/fct0
(Example) # fio-format -b 4K /dev/fct0
(Example) # fio-attach /dev/fct0
```

   Remarks
   For details on each command, see the *ioMemory Product Family User Guide (Linux) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
   http://jp.fujitsu.com/platform/server/primequest/download-e/

8. Create a swap entry for the replacement PCI card.
   Remarks
   You need to create a partition before creating a swap entry.

```
(Example) # mkswap /dev/fioa1
(Example) # swapon /dev/fioa1
```

9. Confirm the serial number of the replacement PCI card.
   For details on how to confirm the serial number, see the *ioMemory Product Family User Guide (Linux) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
   http://jp.fujitsu.com/platform/server/primequest/download-e/

10. Register the serial number of the replacement PCI card in preallocate_memory in /etc/modprobe.d/iomemory-vsl.conf.

    Note

    After replacing the PCI card, add the serial number of the replacement to preallocate_memory in /etc/modprobe.d/iomemory-vsl.conf.

    For details on the procedure, see the *ioMemory Product Family User Guide (Linux) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
    http://jp.fujitsu.com/platform/server/primequest/download-e/

11. Restart the partition (OS).

In a SWAP configuration (Windows configuration)

1. Confirm the serial number of the faulty PCI card.

```
(Example) fio-config –g FIO_PREALLOCATE_MEMORY
          FIO_PREALLOCATE_MEMORY = xxxxxxxxx
```

    For the procedure to confirm the serial number, see the *ioMemory Product Family User Guide (Microsoft Windows) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
    http://jp.fujitsu.com/platform/server/primequest/download-e/

2. Delete the serial number of the PCI card from PREALLOCATE_MEMORY.

```
(Example) fio-config –p FIO_PREALLOCATE_MEMORY 0
```

    Note

    - Before replacing the PCI card, delete the serial number of the faulty PCI card from PREALLOCATE_MEMORY.
      For details, see the *ioMemory Product Family User Guide (Microsoft Windows) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
      http://jp.fujitsu.com/platform/server/primequest/download-e/
    - To configure SWAP with multiple PCI cards, delete all the PCI card serial numbers.

3. Power off the partition.
   For details on powering off partitions, see 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

4. Replace the faulty PCI card.

5. Power on the partition.
   For details on powering on partitions, see 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

6. Format the replacement PCI card.
   Use the following procedure. (Execute commands from the command prompt.)

1. fio-detach (Disconnecting the device from the operating system)
2. fio-format (Low-level formatting of the device)

   Remarks

   If the device is used as a swap device, the formatting must have a 4K sector size.
3. fio-attach (Making the device available on the operating system)

```
(Example) #  fio-detach /dev/fct0
(Example) #  fio-format -b 4K /dev/fct0
(Example) #  fio-attach /dev/fct0
```

Remarks

For details on each command, see the *ioMemory Product Family User Guide (Microsoft Windows) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
http://jp.fujitsu.com/platform/server/primequest/download-e/

7. Create a volume for the replacement PCI card.
   Create a new volume from [Disk Management] in Windows.

8. Confirm the serial number of the replacement PCI card.

```
(Example) fio-config –g FIO_PREALLOCATE_MEMORY
          FIO_PREALLOCATE_MEMORY = xxxxxxxxx
```

For details on how to confirm the serial number, see the *ioMemory Product Family User Guide (Microsoft Windows) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
http://jp.fujitsu.com/platform/server/primequest/download-e/

9. Register the serial number of the replacement PCI card in PREALLOCATE_MEMORY.

```
(Example) fio-config –p FIO_PREALLOCATE_MEMORY xxxxxxxxx
          FIO_PREALLOCATE_MEMORY = xxxxxxxxx
```

Note

- After replacing the PCI card, add the serial number of the replacement to PREALLOCATE_MEMORY.
  After replacing the PCI card, add the serial number of the replacement to preallocate_memory in /etc/modprobe.d/iomemory-vsl.conf.
  For details on the procedure, see the *ioMemory Product Family User Guide (Microsoft Windows) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
  http://jp.fujitsu.com/platform/server/primequest/download-e/
- To configure SWAP with multiple PCI cards, register all the PCI card serial numbers, including the serial number of the PCI card being replaced.

10. Restart the partition (OS).

3.4 Adding Components

This section describes how to add components.
The following lists the components and their expandability by maintenance mode. Some components cannot be added.

TABLE 3.11 Expandability of components and addition conditions

Component name		AC power off (cold system)	AC power on All partitions off (hot-system cold-partition maintenance)	AC power on Target partition off (hot-system cold-partition maintenance)	AC power on Target partition on (hot maintenance)
PSU (*1)		Expandable	Expandable	Expandable	Expandable
FAN (*1)		N/A	N/A	N/A	N/A
SB		Expandable	Expandable	Expandable	Not expandable
SB	VRM (*2)	Expandable	Expandable	Expandable	Not expandable
	CPU	Expandable	Expandable	Expandable	Not expandable
	DIMM	Expandable	Expandable	Expandable	Not expandable
	Battery	N/A	N/A	N/A	N/A
IOB		Expandable	Expandable	Expandable	Not expandable
IOB	PCI Express card	Expandable	Expandable	Expandable	Expandable (*3, *6)
GSPB		Expandable	Expandable	Expandable	Not expandable
SAS disk unit (*4)		Expandable	Expandable	Expandable	Not expandable
SAS disk unit	SAS card	N/A	N/A	N/A	N/A
	HDD	Expandable	Expandable	Expandable	Expandable (*5)
SAS array disk unit	SAS array controller card	N/A	N/A	N/A	N/A
	BBU	N/A	N/A	N/A	N/A
	HDD	Expandable	Expandable	Expandable	Expandable (*5)
MMB (*1)		Expandable	Expandable	Expandable	Expandable
DVD board		N/A	N/A	N/A	N/A
DVD drive		N/A	N/A	N/A	N/A
PCI_Box		Expandable	Expandable	Expandable	Not expandable

Component name			AC power off (cold system)	AC power on All partitions off (hot-system cold-partition maintenance)	AC power on Target partition off (hot-system cold-partition maintenance)	AC power on Target partition on (hot maintenance)
PCI_Box	IO_PSU		N/A	N/A	N/A	N/A
	FAN		N/A	N/A	N/A	N/A
	PEXU		N/A	N/A	N/A	N/A
	PEXU	PCI Express card	Expandable	Expandable	Expandable	Expandable (*3, *6)

*1 The component does not belong to any partition.

*2 CPU expansion requires VRM expansion for both the CPU core and the cache.

*3 The PCI Hot Plug function is required.

*4 One SAS disk unit or SAS array disk unit and one SAS card or SAS array controller card make one set of maintenance parts. Replacing only the card is not possible.

*5 This is supported only in Linux. For details on Xen, KVM, or VMware support in Linux, contact the distributor where you purchased your product, or a Fujitsu sales representative or systems engineer (SE).

*6 Hot maintenance of a 785 GB/1.2 TB internal solid-state drive that uses a PCI slot is not possible. Stop the partition before the replacement.

License authentication with SB and enable kit combinations

If you purchased the SB together with the Windows Server 2008 R2/2012 Enable Kit, you need not perform the Windows license authentication procedure. If you use a separately purchased SB as the Home SB, you need to perform the license authentication procedure even if you use the Windows Server 2008 R2/2012 Enable Kit.

Perform license authentication by following the on-screen Windows instructions.

- Windows license authentication
  1. When starting Windows, click the balloon for license authentication that is displayed in the task tray.
  2. Click [Input Product Key], and input the product key found on the COA label that comes with the Enable Kit.
  3. You can perform license authentication via the Internet or by making a phone call to a Microsoft customer service center.

Hot expansion procedure for hard disks

For the hot expansion procedure for hard disks, see CHAPTER 4 Hot Replacement of Hard Disks.

Changing firmware at a component expansion

When a component is expanded, it may be required to change the firmware.

In a partition, use the same firmware version of the SAS/SAS array controller card (including the ones contained in the SAS disk unit and the SAS array disk unit) and the FC card (Fibre Channel card).

- SAS/SAS array controller card:
  Update it to the latest supported version before use.
- FC card (PCI Express card):
  Use the same version of it as the version of the firmware that is currently used.

How to confirm the version number of firmware

After a card is added and the partition is started, use the following procedure to confirm the firmware version.

- How to confirm the firmware version of the SAS array controller card
  To confirm the version number, see APPENDIX K How to Confirm Firmware of SAS Array Controller Card.
- How to confirm the version number of the firmware of FC card
  To confirm the version number, see Section 1.2.14 [IOB] menu or Section 1.2.17 [PCI_Box] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

Changing the firmware

When the version numbers of firmware are not identical, change the firmware.

The information about the firmware and the procedures are provided in the following web site.

Download of drivers and the bundled software of PRIMEQUEST 1000 series:

http://jp.fujitsu.com/platform/server/primequest/download-e/

Remarks

In the PRIMEQUEST 1000 series, the customer may have to perform part of the firmware change.

3.4.1 Addition procedures in hot maintenance

This section describes the procedures before and after expansion in hot maintenance.

Procedure before expansion

Stop the relevant partition according to 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

Procedure after expansion

Start the relevant partition according to 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

3.4.2 Addition procedures in cold maintenance

This section describes the procedures before and after expansion in cold maintenance.

Procedure before expansion

Stop all the partitions according to 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

Procedure after expansion

Start the necessary partition according to 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

3.4.3 Adding an internal solid-state drive that uses a PCI slot

This section describes the procedure for adding an internal solid-state drive that uses a PCI slot (a 785 GB/1.2 TB internal solid-state drive).

Note

Hot replacement of an internal solid-state drive that uses a PCI slot is not supported. Stop the partition before the addition.

In a RAID configuration (Linux software RAID/Windows software RAID)

1. Power off the partition.
   For details on powering off partitions, see 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

2. Add the PCI card.

3. Power on the partition.
   For details on powering on partitions, see 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

4. Make environmental settings for the added PCI card.

Remarks

For details on the environmental settings, see the *ioMemory Product Family User Guide (Linux) for Driver Release x.x.x* or see the *ioMemory Product Family User Guide (Microsoft Windows) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
http://jp.fujitsu.com/platform/server/primequest/download-e/

In a SWAP configuration (Linux / Windows)

1. Power off the partition.
   For details on stopping partitions, see 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

2. Add the PCI card.

3. Power on the partition.
   For details on powering on partitions, see 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

4. Make environmental settings for the added PCI card.
   Remarks

For details on the environmental settings, see the *ioMemory Product Family User Guide (Linux) for Driver Release x.x.x* or see the *ioMemory Product Family User Guide (Microsoft Windows) for Driver Release x.x.x* (x.x.x is the version number) at the following website:
http://jp.fujitsu.com/platform/server/primequest/download-e/

5. Restart the partition (OS).

3.5 Removing Components

This section describes how to remove components.

3.5.1 Removable components

The following lists the components and component removal conditions. Some components cannot be removed. N/A in all the condition columns below indicates components that are not removable.

TABLE 3.12 Component removal conditions

Component name		AC power off	AC power on /PSU off	AC power on/PSU on Target partition off	AC power on/PSU on Target partition on
PSU (*1)		Removable	Removable	Removable	Removable
FAN (*1)		N/A	N/A	N/A	N/A
SB		Removable	Removable	Removable	Not expandable
SB	VRM (*2)	Removable	Removable	Removable	Not expandable
	CPU	Removable	Removable	Removable	Not expandable
	DIMM	Removable	Removable	Removable	Not expandable
	Battery	N/A	N/A	N/A	N/A
IOB		Removable	Removable	Removable (*3)	Not removable
IOB	PCI Express card	Removable	Removable	Removable	Removable (*4, *7)
GSPB		Removable	Removable	Removable (*3)	Not removable
SAS disk unit (*5)		Removable	Removable	Removable	Not removable
SAS disk unit	SAS card	N/A	N/A (*5)	N/A	N/A
	HDD	Removable	Removable	Removable	Removable (*6)
SAS array disk unit	SAS array controller card	N/A	N/A	N/A	N/A
	BBU	N/A	N/A	N/A	N/A
	HDD	Removable	Removable	Removable	Removable (*6)
MMB (*1)		Removable	Removable	Removable	Removable
MMB	Battery	N/A	N/A	N/A	N/A
DVD board		N/A	N/A	N/A	N/A
DVD drive		N/A	N/A	N/A	N/A

Component name			AC power off	AC power on /PSU off	AC power on/PSU on Target partition off	AC power on/PSU on Target partition on
PCI_Box			Removable	Removable	Removable (*3)	Not removable
PCI_ Box	IO_PSU		N/A	N/A	N/A	N/A
	FAN		N/A	N/A	N/A	N/A
	PEXU		N/A	N/A	N/A	N/A
	PEXU	PCI Express card	Removable	Removable	Removable	Removable (*4, *7)

*1 The component does not belong to any partition.

*2 CPU removal requires VRM removal for both the CPU core and the cache.

*3 The LGSPB, LIOB, and LPCI_Box in a partition share physical hardware. Therefore, the partition using the components needs to be shut down. Before IOB replacement, the partitions using the GSPB must be shut down.

*4 The PCI Hot Plug function is required. In a system running Windows, it cannot be removed.

*5 One SAS disk unit or SAS array disk unit and one SAS card or SAS array controller card make one set of maintenance parts. Replacing only the card is not possible.

*6 This is supported only in Linux. For details on Xen, KVM, or VMware support in Linux, contact the distributor where you purchased your product, or a Fujitsu sales representative or systems engineer (SE).

*7 Hot maintenance of a 785 GB/1.2 TB internal solid-state drive that uses a PCI slot is not possible. Stop the partition before the replacement.

Hard disk removal procedure in hot maintenance

For the hard disk removal procedure in hot maintenance, see CHAPTER 4 Hot Replacement of Hard Disks.

3.5.2 Removing an internal solid-state drive that uses a PCI slot

This section describes the procedure for removing an internal solid-state drive that uses a PCI slot (a 785 GB/1.2 TB internal solid-state drive).

Note

Hot replacement of an internal solid-state drive that uses a PCI slot is not supported. Stop the partition before the deletion.

In a RAID configuration (LINUX software RAID/Windows software RAID)

1. Cancel the environmental settings of the PCI card in use.

2. Power off the partition.
   For details on powering off partitions, see 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

3. Remove the PCI card.

4. Power on the partition.
   For details on powering on partitions, see 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

In a SWAP configuration (Linux / Windows)

1. Cancel the environmental settings of the PCI card in use.

2. Power off the partition.
   For details on powering off partitions, see 8.1.2 Powering off a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

3. Remove the PCI card.

4. Power on the partition.
   For details on powering on partitions, see 8.1.1 Powering on a partition in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

3.6 Processes after Reserved SB Switching and an Automatic Partition Reboot

This section describes the processes after Reserved SB switching and an automatic partition reboot (e.g., status check, reconfiguration).

3.6.1 Checking the status after Reserved SB switching and an automatic partition reboot

After the partition reboots, perform a status check by using the [Partition Configuration] window, [System Status] window, and [SB#x] window from the MMB Web-UI.
Immediately after a faulty SB is switched with a Reserved SB and the partition reboots, the status is as follows.

- The Reserved SB is incorporated in the partition in place of the faulty SB.
- If the incorporated Reserved SB was a Reserved SB for multiple partitions before the switch, the Reserved SB setting for multiple partitions has been canceled.
- The faulty SB is disconnected (free) from the configuration of the partition.

3.6.2 Processing after replacement of a faulty SB

This section describes how to reconfigure a Reserved SB after replacement of a faulty SB. Make settings as needed, taking account of the current configuration and operating state.
After the Reserved SB switching and partition reboot, perform the following task 1 or 2. To continue operation without setting a new Reserved SB, the partition configuration needs to be reset.

1. Restore the Reserved SB that was incorporated to replace the faulty SB back to a Reserved SB again.
2. Set the replacement SB as a Reserved SB.

The procedure for the above task 1 is as follows.

1. The Reserved SB incorporated in place of the faulty SB is referred to below as the replacement Reserved SB. Identify all partitions configured with the replacement Reserved SB, by using logged information.
   For the partition identification procedure, see 3.6.3 Checking the partition setting information at the Reserved SB switching time.

2. Check the status.
   Click [System] - [System Status]. Check the status in the [System Status] window.

3. Stop the partition.
   1) Click [Partition] - [Power Control].
   The [Power Control] window appears.
   2) Select [Power Off] in [Power Control] for the partition. Then, click the [Apply] button.

4. Check the configuration of the partition.
   Click [Partition] - [Partition Configuration]. Confirm the partition configuration in the [Partition Configuration] window.

5. Incorporate the replacement SB into the partition.
    1. Click [Partition] - [Partition Configuration] - [Add Unit] button.
       The [Add SB/IOB/GSPB to Partition] window appears.
    2. Click the radio button of the replacement SB.
       Then, click the [Apply] button. The replacement SB is incorporated into the partition.

6. Restore the replacement Reserved SB back to a Reserved SB again.
    1. Click [Partition] - [Partition Configuration] - [Remove Unit] button. The [Remove SB/IOB/GSPB from Partition] window appears.
    2. Click the radio button of the replacement Reserved SB. Then, click the [Apply] button. The replacement Reserved SB is disconnected (free) from the partition.
    3. Click [Partition] - [Reserved SB Configuration]. Check the check box of the SB set free in the above step 2, in the [Reserved SB Configuration] window. Select the partition to reserve the SB for its configuration. Then, click the [Apply] button. To reserve the SB for the configurations of multiple partitions, select the partitions and then click the [Apply] button.

7. Start the partition.
   Click [Partition] - [Power Control]. Select [Power on] for [Power Control] for the partition in the [Power Control] window. Then, click the [Apply] button. Start the partition.

Setting the replacement SB as a Reserved SB

Use the following procedure for the replaced SB.

1. The Reserved SB incorporated in place of the faulty SB is referred to below as the replacement Reserved SB. Identify all partitions configured with the replacement Reserved SB, by using logged information.
   For the partition identification procedure, see 3.6.3 Checking the partition setting information at the Reserved SB switching time.

2. Check the status.
   Click [System] - [System Status]. Check the status in the [System Status] window.

3. Check the configuration of the partition.
   Click [Partition] - [Partition Configuration].
   Confirm the partition configuration in the [Partition Configuration] window.

4. Set the replacement Reserved SB as a Reserved SB.
    1. Click [Partition] - [Reserved SB Configuration].
       The [Reserved SB Configuration] window appears.
    2. Check the check box of the SB replaced for maintenance.
       Select a partition to reserve the SB for its configuration and click the [Apply] button. To reserve the SB for the configurations of multiple partitions, select the partitions and then click the [Apply] button.

3.6.3 Checking the partition setting information at the Reserved SB switching time

This section describes how to check the partition setting information at the Reserved SB switching time.

Note

The SEL information output from the MMB can be presumed to have the original partition settings. However, precise information is not guaranteed. Therefore, it is necessary to determine the original configuration of partitions according to how the partitions were operating when the Reserved SB became active.

The following descriptions assume a case of the following partition and Reserved SB setup. SB#c of Partition#R is set as a Reserved SB for Partition#P and Partition#Q.

TABLE 3.13 Partition settings (before switching)

Set partition	SB		
	a	b	c
Partition#P	O		
Partition#Q		O	
Partition#R			O

O: Indicates that the SB is set for the partition.

TABLE 3.14 Reserved SB settings (before switching)

Set partition	SB		
	a	b	c
Partition#P			O
Partition#Q			O
Partition#R			

O: Indicates that the SB is set for the partition.

If a failure occurs on SB#a, and SB#a is switched to Reserved SB#c, the statuses of the SBs of the partitions change as follows:

Partition#P:SB#a Partition#P:SB#c
Partition#Q:SB#b -> Partition#Q:SB#b
Partition#R:SB#c Partition#R:----

In the following table, TABLE 3.15 Partition status transitions, (1) to (4) indicate the status transitions of each partition.

TABLE 3.15 Partition status transitions

Partition	Status transition (in chronological order: left to right)			
	(1)	(2)	(3)	(4)
Partition#P	In operation	Faulty	Reset/SB switching	Power on -> In operation
Partition#Q	In operation	In operation	In operation	In operation
Partition#R	In operation	In operation	Power off	Power off

If Partition#P, Partition#Q, and Partition#R are all operating, the partition status is as indicated in (1) in the table. The following explains what happens if SB#0 becomes faulty later, is disconnected, and is switched to SB#2, which is set as a Reserved SB.

TABLE 3.16 Explanation of partition status transitions

No.	Description (numbers correspond to status transitions)
(1)	Partition#P, Partition#Q, and Partition#R are operating.
(2)	SB#0 in Partition#P becomes faulty.
(3)	SB#0 in Partition#P is disconnected and stopped. Then, the power to Partition#R is turned off. Later, SB#2 is removed from the Partition#R configuration, and the specification of Partition#Q as a Reserved SB is canceled.
(4)	After being removed from the Partition#Q configuration, SB#2 is incorporated as the SB of Partition#P. The power to Partition#P is automatically turned on, and the partition begins operation.

In status transitions (1) to (4), SB#2 is incorporated into Partition#P in place of faulty SB#0, is restarted, and begins operation.
Partition#Q is not affected. Partition#R stops, and SB#2 is removed from its configuration.
SB#2 was set as a Reserved SB in (1) and is subsequently cleared from this status.

The resultant status is given in TABLE 3.17 Partition settings (after switching) and TABLE 3.18 Reserved SB settings (after switching). After the SB is switched to the Reserved SB, the MMB changes the settings as follows.

TABLE 3.17 Partition settings (after switching)

Set partition	SB		
	a	b	c
Partition#P			O
Partition#Q		O	
Partition#R			

O: Indicates that the SB is set for the partition.

TABLE 3.18 Reserved SB settings (after switching)

Set partition	SB		
	a	b	c
Partition#P			
Partition#Q			
Partition#R			

When switching to a Reserved SB takes place as described above, the MMB displays the following SEL information:

SEL-1. SB#a was replaced with Reserved SB#c in Partition#P
SEL-2. Reserved SB#c was removed from Partition#Q
SEL-3. Reserved SB#c was removed from Partition#R

SEL-1 indicates that SB#a for Partition#P was replaced by SB#c as a Reserved SB.
The SEL-2 and SEL-3 messages indicate that the Reserved SB setting for SB#c was canceled or SB#c was removed from the operating partition.
The partition operation before and after the switching determines the status.
In the above example, Partition#R was powered off immediately before SB#c was removed. Therefore, the user can determine that SB#c was removed from operating Partition#R.

CHAPTER 4 Hot Replacement of Hard Disks

This chapter describes hot replacement of hard disks. This operation is supported only in Red Hat.
However, the tasks described in 4.3 Replacing Hard Disks in a Hardware RAID Configuration are also supported in Windows.
The chapter describes only the procedures for the PRIMEQUEST 1800E. For the PRIMEQUEST 1800E2, contact the distributor where you purchased your product, or your sales representative.

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4.1 Overview of Hard Disk Hot Replacement

PSA (PRIMEQUEST 1800E) has helpful functions for hot replacement of hard disks in partitions. If you conclude a system maintenance agreement, a certified service engineer will be responsible for replacing the hard disks.
PSA (PRIMEQUEST 1800E) provides functions that control disk LEDs and display the disk status when a hardware failure is detected, a disk is replaced, or a disk is added.

Notes

- This operation does not apply to RAID devices. For details on how to replace a hard disk of an array controller card, see 4.3 Replacing Hard Disks in a Hardware RAID Configuration.
- VMware does not support hot replacement of hard disks.
- The following message may appear for a mounted hard disk. It does not indicate any operational problem.

```
kernel: mptscsih: ioc0: >> Attempting bus reset!
(sc=e000004082adc480)
kernel: mptbase: ioc0: IOCStatus(0x0048): SCSI Task Terminated
```

- After mounting a hard disk, you may need to pause the disk rotation to mount it on another slot. If so, wait about 60 seconds after you mounted the disk, before stopping the disk rotation. The operating system executes the Hot Plug process when the disk is mounted. Therefore, if you immediately stop the disk rotation, the following error may occur.

```
kernel: Device sdb not ready.
kernel: end_request: I/O error, dev sdb, sector 204706
kernel: Buffer I/O error on device sdb1, logical block 6396
```

- PSA should not be started during execution of a disk management command. Otherwise, PSA will not operate normally. After the command is completed, start PSA.
- The concurrent execution of multiple instances of the disk management command may cause PSA to terminate abnormally. Before executing a disk management command, confirm that no other instance of the command is being executed.
- You can perform the following operations with the disk management command. For details, see 4.2 Disk Management Command (diskctrl) in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).
  - Displaying a list of SGPIO and SES controllers or a list of hard disks managed by the controllers
  - Turning off a hard disk location LED or causing it to blink
- Delete the configuration information cache file of the file system (Red Hat Enterprise Linux).
  After hot replacement, addition, or removal of a hard disk, execute the following command to delete the configuration information cache file of the file system. Likewise, delete the file before static replacement, addition, or removal of a hard disk.

```
# rm /etc/blkid/blkid.tab
```

  If the cache file exists with /etc/blkid/blkid.tab retaining the file system configuration, Red Hat Enterprise Linux uses the information in the file as it checks the file system with the fsck command.
  The system status will not match the /etc/blkid/blkid.tab contents during hot replacement, hot addition, or hot removal of disks. For this reason, the check at the next execution of the fsck command will be incorrect, which may damage the file system.
  Once created, this file is not updated. That is why the cache file must be deleted after hot replacement, addition, or removal of a hard disk as well as before static replacement, addition, or removal of a hard disk.

Deleting the cache file does not cause any problems because it will be re-created as needed.

- Stop the smartd service (Red Hat Enterprise Linux 5).

  During hot maintenance of a hard disk (hot replacement, addition, or removal), stop the smartd service.
  The smartd service is intended to monitor a hard disk by using the self-diagnosis function of the hard disk, S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology System).
  The smartd service does not support the hot maintenance of a hard disk, so that the hard disk information acquired at the start of the smartd service will not match the hard disk information after the hot maintenance. Consequently, it will output the following message every 30 minutes.

```
smartd[XXXXX]: Device: /dev/YYY, No such device, open() failed
```

  XXXXX and YYY: These parts vary with the environment.

  That is why if the smartd service is used, the smartd service must be stopped before hot maintenance of a hard disk and the smartd service must be restarted with the latest hard disk status after hot maintenance.

  The procedure is as follows.

  1. Before hot maintenance of a hard disk, stop the smartd service.
     The running condition of the smartd service can be checked from the output result of the following operation.
     Example: Output results when the smartd service is running

```
# /sbin/service smartd status
smartd (pid XXXXX) is running...
```

     XXXXX: This part varies with the environment.

     If the smartd service has been started, stop it by using the following operation.

```
# /sbin/service smartd stop
```

  2. Execute hot maintenance of a hard disk, and complete it.

  3. Start the smartd service.
     After stopping the smartd service in step 1, you will need to restart it after the hot maintenance of a hard disk is completed.
     Start the smartd service by using the following operation.

```
# /sbin/service smartd start
```

4.2 Adding, Removing, and Replacing Hard Disks

This section describes procedures using the disk management command to add, remove, and replace hard disks. These descriptions use a SASU internal hard disk as an example. In the device names displayed by the disk management command, iocx represents a SGPIO controller, and /dev/sdx represents a hard disk.

4.2.1 Addition procedure

Add a hard disk by using the following procedure.

1. Insert the hard disk into an empty SASU slot.

2. Confirm the location of the inserted hard disk by displaying the status with the disk management command.

```
# /opt/FJSVpsa/bin/diskctrl -l
 ioc0
   0 /dev/sda       Fault LED-Off
   1 /dev/sdb       Fault LED-Off
   3 /dev/sdc       Fault LED-Off
   4 /dev/sdd       Fault LED-Off
```

   Shortly after you insert the hard disk, the disk becomes accessible. Identify the slot that has the inserted hard disk in the next step.

3. Cause the Fault LED to blink by executing the location display function of the disk management command.

```
# /opt/FJSVpsa/bin/diskctrl  -i ioc0/1
```

4. Check whether the Fault LED of the slot that has the inserted hard disk is blinking.
   When the slot location is correct, confirm that "Fault LED-Identify" is displayed for the slot by the status display function of the disk management command.

```
# /opt/FJSVpsa/bin/diskctrl -l
ioc0
0 none
1 none  Fault LED-Identify
```

   Remarks

   - If the slot location is incorrect in step 4:
     Turn off the blinking Fault LED by executing the location off function of the disk management command.

```
# /opt/FJSVpsa/bin/diskctrl  -o ioc0/1
```

     Repeat steps 3 and 4 by specifying other slots until the correct slot location is confirmed.

Remarks

In the following case, execute the following PSA command manually.

- You are performing hot maintenance of the hard disk with PRIMECLUSTER GDS in Red Hat.

```
/opt/FJSVpsa/sh/force_search.sh -a
```

4.2.2 Removal procedure

Remove the hard disk by using the following procedure.

1. To remove a hard disk containing a partition specified as a raw or swap device, take action as follows.
   - If the hard disk contains a raw device:
     If the hard disk to be removed contains a partition operating as a raw device, terminate all the applications that may access this partition as the raw device. Then, remove the hard disk.
   - If the hard disk contains a swap device:
     If the hard disk to be removed contains a partition specified as a swap device, stop the system. Then, replace the hard disk.

2. Take action as follows. The action depends on whether the hard disk to be removed has the Mirror configuration in PRIMECLUSTER GDS.
   - If the hard disk to be removed has the Mirror configuration in PRIMECLUSTER GDS:
     From PRIMECLUSTER GDS, select the disk to be removed, and remove it. For details on the removal procedure, see the PRIMECLUSTER GDS manual.
   - If the hard disk to be removed does not have the Mirror configuration in PRIMECLUSTER GDS:
     Unmount all the disk partitions mounted on the disk to be removed.

     ```
     # umount  /dev/sdc1
     # umount  /dev/sdc2
                          .
                          .
                          .
     ```

     Remarks

     You need not unmount any partition operating as a raw or swap device. However, the removal of devices requires changes to the raw and swap device settings.

3. Use the disk management command to stop the disk rotation.
   Execute the disk management command to perform the following processes.
   - Stop the disk rotation. The Fault LED (amber) goes on.
   - Instruct the operating system to remove the target disk.

     ```
     # /opt/FJSVpsa/bin/diskctrl -e /dev/sdc
     ```

4. Remove the hard disk at the location indicated by the Fault LED (amber) that is on. When an internal hard disk is removed, the Fault LED behind its slot goes on. The Fault LED goes on or blinks until it is turned off by the disk management command or the partition is powered off or rebooted.

Note

If there is an SSD, removing the SSD may output the W13139 message from FJSVpsa to the system event log.

To turn off the Fault LED with the disk management command, perform the following operations.

1) Display the status by executing the disk management command, and confirm the location with the Fault LED that is on.

```
# /opt/FJSVpsa/bin/diskctrl -l
 ioc0
   0 /dev/sda       Fault LED-Off
   1 /dev/sdb       Fault LED-Off
   2 none           Fault LED-On
   3 /dev/sdd       Fault LED-Off
```

From the above example, you can confirm that the Fault LED of slot 2 of ioc0 is on, so sdc was used in that slot.

2) Turn off the Fault LED by executing the following disk management command.

```
# /opt/FJSVpsa/bin/diskctrl -o ioc0/2
```

The Fault LED goes out.

Display the status by executing the disk management command.
You can confirm that "none" is displayed as the device name of slot 2 of ioc0 and the slot is empty.

```
# /opt/FJSVpsa/bin/diskctrl -l
 ioc0
   0 /dev/sda       Fault LED-Off
   1 /dev/sdb       Fault LED-Off
   2 none
   3 /dev/sdd       Fault LED-Off
```

5. Execute the following PSA command.
   - You are performing hot maintenance of the hard disk with PRIMECLUSTER GDS in Red Hat.

```
/opt/FJSVpsa/sh/force_search.sh -a
```

4.2.3 Replacement procedure (for hard disk failures not causing non-responsiveness)

If a hard disk fails or is predicted to fail by S.M.A.R.T. proactive detection, replace the hard disk by using the following procedure.

1. To replace a hard disk containing a partition specified as a raw or swap device, take action as follows.
   - If the hard disk contains a raw device:
     If the hard disk to be replaced contains a partition operating as a raw device, terminate all the applications that may access this partition as the raw device. Then, replace the hard disk.
   - If the hard disk contains a swap device:
     The target hard disk contains a partition specified as a swap device. Stop the system. Then, replace the hard disk.

2. Take action as follows. The action depends on whether the target hard disk has the Mirror configuration in PRIMECLUSTER GDS.
   - In the Mirror configuration in PRIMECLUSTER GDS:
     From PRIMECLUSTER GDS, select the disk to be removed, and remove it. For details on the removal procedure, see the PRIMECLUSTER GDS manual.
   - Not in the Mirror configuration in PRIMECLUSTER GDS:
     Unmount all the disk partitions mounted on the disk to be replaced.

```
# umount  /dev/sdc1
# umount  /dev/sdc2
                        .
                        .
                        .
```

Remarks

You need not unmount any partition operating as a raw or swap device.

3. Use the disk management command to stop the disk rotation.
   Execute the disk management command to perform the following processes.
   - Stop the disk rotation. The Fault LED (amber) goes on
   - Instruct the operating system to remove the target disk.

```
# /opt/FJSVpsa/bin/diskctrl -e /dev/sdc
```

   Remove the hard disk at the location indicated by the Fault LED (amber) that is on.

4. Display the status by executing the disk management command, and confirm the location with the Fault LED that is on.

```
# /opt/FJSVpsa/bin/diskctrl -l
 ioc0
   0 /dev/sda       Fault LED-Off
   1 /dev/sdb       Fault LED-Off
   2 --mount        Fault LED-On
   3 /dev/sdd       Fault LED-Off
```

5. Replace the disk.
   You can confirm that the hard disk is inserted into slot 2 of ioc0 because the Fault LED is on in that slot.

Turn off the Fault LED by executing the following disk management command.

```
# /opt/FJSVpsa/bin/diskctrl -c ioc0/2
```

Note

If there is anSSD, removing the SSD may output the W13139 message from FJSVpsa to the systemevent log.

Confirm the location of the inserted hard disk by displaying the status with the disk management command.

```
# /opt/FJSVpsa/bin/diskctrl -l
 ioc0
   0 /dev/sda       Fault LED-Off
   1 /dev/sdb       Fault LED-Off
   2 /dev/sdc       Fault LED-Off
   3 /dev/sdd       Fault LED-Off
```

Remarks

When a disk is removed, the information for the removed disk remains in the PSA window. In contrast, when a disk is mounted, the information in the window is updated with the information for the mounted disk.

6. After the disk management command is completed, mount the disk partitions. If the disk has the Mirror configuration in PRIMECLUSTER GDS, incorporate it in PRIMECLUSTER GDS.

   Remarks

   In the following case, execute the following PSA command manually:

   - You are performing hot maintenance of the hard disk with PRIMECLUSTER GDS in Red Hat.

     ```
     /opt/FJSVpsa/sh/force_search.sh -a
     ```

7. To restore each raw device, take action as follows.
   - If the hard disk had contained a raw device:
     Configure the raw device according to the manual of the application used for raw access to the replacement hard disk. That application was stopped before the replacement. After completing the configuration, restart the application.

4.2.4 Replacement procedure (for hard disk failures causing non-responsiveness)

If HDD recovery using an HDD driver is not possible because a hard disk failure caused the relevant HDD to hang, replace the hard disk by using the following procedure.

1. If the system is non-responsive because of a hard disk failure, the following message detected by PSA appears and the Fault LED of the hard disk goes on:
   For RHEL5:

```
FJSVpsa: E 14134 IOB#n-HDD#n scsi:%h:%c:%i:%l \
Device error (offlined) vendor=xxxxxxxx \
model=xxxxxxxx serial-no=xxxxxxxxxx \
SCSI number: %h=host number, %c=channel number, \
%i=id number, %l=lun number
```

The \ at the end of a line indicates that there is no line feed.

2. Confirm the status by executing the disk management command. At this time, the disk whose Fault LED is on is the disk (*) where the offline error occurred.
   - RHEL5:
     SASU internal disk

```
# /opt/FJSVpsa/bin/diskctrl -l
ioc0
      0  /dev/sda  Fault LED-Off
      1  /dev/sdb  Fault LED-Off
      2  --mount   Fault LED-On      <- (*)
      3  /dev/sdd  Fault LED-Off
```

3. To replace a hard disk containing a partition specified as a raw or swap device, take action as follows.
   - If the hard disk contains a raw device:
     If the hard disk to be replaced contains a partition operating as a raw device, terminate all the applications that may access this partition as the raw device. Then, replace the hard disk.
   - If the hard disk contains a swap device:
     The target hard disk contains a partition specified as a swap device. Stop the system. Then, replace the hard disk.

4. Take action as follows. The action depends on whether the target hard disk has the Mirror configuration in PRIMECLUSTER GDS.
   - In the Mirror configuration in PRIMECLUSTER GDS:
     From PRIMECLUSTER GDS, select the disk to be removed, and remove it. For details on the removal procedure, see the PRIMECLUSTER GDS manual.
   - Not in the Mirror configuration in PRIMECLUSTER GDS:
     Unmount all the disk partitions mounted on the disk to be replaced.

```
# umount  /dev/sdc1
# umount  /dev/sdc2
                      .
                      .
                      .
```

Remarks

You need not unmount any partition operating as a raw or swap device.

5. Use the disk management command to stop the disk rotation. Stop the disk rotation by specifying the slot confirmed in step 3.

```
# /opt/FJSVpsa/bin/diskctrl -e ioc0/2
```

6. Replace the hard disk at the location indicated by the Fault LED (amber) that is on.

7. From the above example, you can confirm that the Fault LED of slot 2 of ioc0 is on, so the inserted hard disk is in that slot.
   Turn off the Fault LED by executing the following disk management command.

```
# /opt/FJSVpsa/bin/diskctrl -c ioc0/2
```

8. Confirm the location of the inserted hard disk by displaying the status with the disk management command.

```
# /opt/FJSVpsa/bin/diskctrl -l
ioc0
         0    /dev/sda    Fault LED-Off
         1    /dev/sdb    Fault LED-Off
         2    /dev/sdc    Fault LED-Off
         3    /dev/sdd    Fault LED-Off
```

9. After the disk management command is completed, mount the disk partitions. If the disk has the Mirror configuration in PRIMECLUSTER GDS, incorporate it in PRIMECLUSTER GDS.

   Remarks
   In the following case, execute the following PSA command manually:
   - You are performing hot maintenance of the hard disk with PRIMECLUSTER GDS in RHEL.

```
/opt/FJSVpsa/sh/force_search.sh -a
```

10. To restore each raw device, take action as follows.
    - If the hard disk had contained a raw device:
      Configure the raw device according to the manual of the application used for raw access to the replacement hard disk. That application was stopped before the replacement. After completing the configuration, restart the application.

4.3 Replacing Hard Disks in a Hardware RAID Configuration

This section describes how to replace hard disks in a Hardware RAID configuration. Monitor HardRAID with ServerView RAID. For details on how to replace hard disks in a Hardware RAID configuration, see the *MegaRAID SAS Software*, the *MegaRAID SAS Device Driver Installation*, and the *Modular RAID Controller Installation Guide*.

4.3.1 Hot replacement of a faulty hard disk

This section describes the workflow for replacing a faulty hard disk.
For the PRIMEQUEST 1800E, perform PSA window operations from the MMB Web-UI.

1. Start ServerView RAID Manager.

2. In the ServerView RAID Manager tree view, confirm the mounting location of the faulty hard disk.
   * A field engineer performs steps 4 to 6 as the hard disk recovery procedure.

3. Confirm that the Alarm LED of the hard disk on the main unit is on.

4. Replace the hard disk whose Alarm LED is on.

5. Follow this step for the PRIMEQUEST 1800E. In the MMB Web-UI, open the PSA window for the partition. Select [PCI Devices] from the left menu. The window displays "Error" or "Warning" at [Status] for the array controller card that manages the faulty hard disk. Select the card. Then, click the [Status Clear] button.

6. After replacing the hard disk, confirm that hard disk replacement was completed properly, by using the following steps depending on whether the disk is a spare disk.
   - If not set as a spare disk:
     ServerView RAID Manager automatically performs a rebuild. Then, the Alarm LED of the hard disk starts blinking.
     Wait until the rebuild is complete in the ServerView RAID Manager window. Confirm that [Status] for the hard disk is [Operational].
   - If set as a spare disk:
     The replacement hard disk automatically becomes a spare disk. Then, the Alarm LED of the hard disk goes out.
     In the [ServerView RAID Manager] window, confirm that [Status] for the hard disk is [Global Hot Spare] or [Dedicated Hot Spare]. After the rebuild is complete, a copyback operation may be performed.

7. Exit ServerView RAID Manager.

4.3.2 Hard disk preventive replacement

This section describes the workflow for preventive replacement of a hard disk S.M.A.R.T predicted to fail.

For the RAID 0 configuration (cold-partition replacement)

To replace a hard disk in the RAID 0 configuration, apply cold-partition maintenance.
The workflow is described below.

1. Back up data in all the hard disks under the array controller card that are subject to preventive replacement.

2. Start ServerView RAID Manager.

3. In ServerView RAID Manager, confirm the mounting location by selecting the hard disk that S.M.A.R.T. predicted to fail.

4. Check whether other hard disks are faulty. If a hard disk is faulty, replace it.

5. Restart the partition. Then, start WebBIOS from the Boot Manager front page.

6. In WebBIOS, select the array controller card connected to the hard disk subject to preventive replacement. Then, execute [Clear Configuration] to erase the data on the hard disk.

7. When the data has been erased, exit WebBIOS and power off the partition.
   * A field engineer performs step 7 as the hard disk recovery procedure.

8. Replace the hard disk that S.M.A.R.T. predicted to fail.

9. Start the partition. Then, start WebBIOS from the Boot Manager front page.

10. In WebBIOS, create an array configuration.

11. Restore backup data or reinstall the operating system.

For the RAID 1, RAID 1E, RAID 5, RAID 6, or RAID 10 configuration (hot replacement)

Hot replacement is applicable to hard disks in the RAID 1, RAID 1E, RAID 5, RAID 6, and RAID 10 configurations.
The workflow is described below.
For the PRIMEQUEST 1800E, perform PSA window operations from the MMB Web-UI.

1. Start ServerView RAID Manager.

2. In ServerView RAID Manager, confirm the mounting location by selecting the hard disk that S.M.A.R.T. predicted to fail.

3. Check whether other hard disks are faulty. If a hard disk is faulty, replace it.

4. Ensure consistency to make the hard disks error-free.

5. In the tree view, select the hard disk that S.M.A.R.T. predicted to fail. Confirm that [Status] is [SMART Error].

6. With the hard disk selected in the tree view, select [Locate device] from the right-click menu to cause the Alarm LED to blink at high speed (interval of 0.3 seconds).

7. Confirm the hard disk location. Then, with the hard disk selected in the tree view, select [Stop location] from the right-click menu to turn off the Alarm LED.

8. With the hard disk selected in the tree view, select [Make Offline] from the right-click menu to turn on the Alarm LED.

9. Confirm that [Status] for the target hard disk is [Failed], [Offline], or [Available].
   * A field engineer performs steps 10 to 12 as the hard disk recovery procedure.

10. Confirm that the Alarm LED of the hard disk on the main unit is on.

11. Replace the hard disk whose Alarm LED is on.

12. In the MMB Web-UI, open the PSA window for the partition. Select [PCI Devices] from the left menu. The window displays "Error" or "Warning" at [Status] for the array controller card that manages the faulty hard disk. Select the card. Then, click the [Status Clear] button.

13. After replacing the hard disk, confirm that hard disk replacement was completed properly, by using the following steps depending on whether the disk is a spare disk.
    - If not set as a spare disk:
      ServerView RAID Manager automatically performs a rebuild. Then, the Alarm LED of the hard disk starts blinking.
      Wait until the rebuild is complete in the ServerView RAID Manager window. Confirm that [Status] for the hard disk is [Operational].
    - If set as a spare disk:
      The replacement hard disk automatically becomes a spare disk. Then, the Alarm LED of the hard disk goes out.
      In the [ServerView RAID Manager] window, confirm that [Status] for the hard disk is [Global Hot Spare] or [Dedicated Hot Spare]. After the rebuild is complete, a copyback operation may be performed.

14. Exit ServerView RAID Manager.

4.3.3 Hard Disk Replacement at Multiple Deadlock Occurrence

Multiple deadlock occurs when more than one hard disk fail to be recognized at the same time.
When multiple deadlock occurs, replace the SAS interface components (array controller card, SASU, etc.) and the hard disk. Since system data is not guaranteed when this type of failure occurs, reconfigure the hardware RAID. This executes the corrective measure of recovering the data after backing it up.
When replacing the SAS interface components and the hard disk, the partition is stopped for maintenance. The workflow is described below.

Remarks
A field engineer performs the following step 2 only.

1. Turn off the power to the partition.

2. Replace the SAS interface components and hard disk.
3. Restart the partition, and then start WebBIOS from the Boot Manager front page.
4. Create the array configuration with WebBIOS.
5. Restore the data for backup.

CHAPTER 5 PCI Card Hot Maintenance in Red Hat Enterprise Linux 5

This chapter describes hot maintenance of PCI cards in Red Hat Enterprise Linux 5.

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5.1 Hot Replacement of PCI Cards

This section describes the following methods of PCI card replacement with the PCI Hot Plug function:

- Common replacement operations for all PCI cards such as power supply operations
- Specific operations added to procedures to use a specified card function or a driver for installation

Remarks

For details on the card replacement procedures not described in this chapter, see the respective product manuals.

5.1.1 Overview of common replacement procedures for all PCI cards

This section provides an overview of common replacement procedures for all PCI cards.

1. Performing the required operating system and software operations depending on the PCI card type
2. Confirming the installation of the Hot Plug driver: See Stopping the ServerView RAID service
3. Powering off a PCI slot: See Powering on and off PCI slots
4. Replacing a PCI card
5. Powering on a PCI slot: See Powering on and off PCI slots
6. Performing the required operating system and software operations depending on the PCI card type

Note

This chapter provides instructions (e.g., commands, configuration file editing) for the operating system and subsystems. Be sure to refer to the respective product manuals to confirm the command syntax and impact on the system before performing tasks with those instructions.

The following sections describe card addition, removal, and replacement with the required instructions (e.g., commands, configuration file editing) for the operating system and subsystems, together with the actual hardware operations.

5.1.2 PCI card replacement procedure in detail

This section describes how to replace a PCI card.

Stopping the ServerView RAID service

When hot replacement of a PCI card is performed while the ServerView RAID service is running, a system panic may occur. For this reason, before starting hot replacement, temporarily stop the ServerView RAID service by using the following procedure.

Note that this work is not required if you are using any of the following versions.

- Red Hat Enterprise Linux 5.8 or later
- Red Hat Enterprise Linux 5.7 and kernel-2.6.18-274.7.1.el5, or later version
- Red Hat Enterprise Linux 5.6 and kernel-2.6.18-238.27.1.el5, or later version
- Red Hat Enterprise Linux 5.3 and kernel-2.6.18-128.35.1.el5, or later version

1. Log in as the system administrator (root).

2. Execute the following command to check the running status of the ServerView RAID service.

```
# /sbin/service aurad status
```

[Display example when the service is running]

```
Checking for ServerView RAID Manager: amDaemon (pid XXX) is running...
```

(XXX indicates the process ID.)

[Display example when the service is stopped]

```
Checking for ServerView RAID Manager: amDaemon is stopped
```

3. If the ServerView RAID service is running, execute the following command to stop the service.

```
#/sbin/service aurad stop
```

Confirming the installation of the PCI Hot Plug driver

The Hot Plug driver must be installed on the system before you hot plug individual cards.

Hot plug driver module for PCI Express cards: pciehp

Confirm the installation of the Hot Plug driver by using the following procedure.

1. Execute the lsmod command. Confirm that the PCI Hot Plug driver module is installed.

```
# /sbin/lsmod | grep pciehp
pciehp                206984  0
```

2. If it is not installed, incorporate the PCI Hot Plug driver module into the system by executing the modprobe command.

```
# /sbin/modprobe pciehp
```

Executing the modprobe command automatically incorporates all relevant modules into the kernel.

Confirming the slot number of a PCI slot

When replacing a PCI card, you need to manipulate the power supply to the appropriate slot, through the operating system. First, use the following procedure to obtain the slot number from the mounting location of the PCI slot for the card. It will be used to manipulate the power supply.

1. Identify the mounting location of the PCI card to be replaced.
   See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be replaced.
2. Obtain the slot number of the mounting location.

Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is the identification information for operating the slot of the PCI card to be replaced.

Checking the power status of a PCI slot

Using the PCI slot number confirmed in Confirming the slot number of a PCI slot, confirm that the /sys/bus/pci/slots directory contains a directory for this slot information, which will be referenced and otherwise used. Below, the PCI slot number confirmed in Confirming the slot number of a PCI slot is shown at <slot number> location in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<BUS number>_<slot number>
```

Note

<BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes. The operational target directory is defined uniquely with <slot number>.

Confirm that the PCI card in the slot is enabled or disabled by displaying the "power" file contents in this directory.

```
# cat /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

When displayed, "0" means disabled, and "1" means enabled.

Powering on and off PCI slots

You can power on and off a PCI slot through an operation on the file confirmed in Checking the power status of a PCI slot.

To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

This operation concurrently removes the device associated with the relevant adapter from the system.

Note

Be sure to manipulate the power supply from the operating system.

To enable the card again and make it available, write "1" to the "power" file in the directory corresponding to the disabled slot.

```
# echo 1 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

This operation concurrently installs the device associated with the relevant adapter on the system.

Note

After power-on, you need to confirm that the card and driver are correctly installed. The procedures vary depending on the card and driver specifications. For the appropriate procedures, see the respective manuals.

Restarting the ServerView RAID service

If the ServerView RAID service was stopped before the start of hot replacement work on a PCI card, restart the service by using the following procedure after the hot replacement work.

1. Log in as the system administrator (root).

2. Execute the following command to restart the ServerView RAID service.

```
# /sbin/service aurad start
```

5.1.3 FC card (Fibre Channel card) replacement procedure

The descriptions in this section assume that an FC card is being replaced.

Notes

- The FC card used for SAN boot does not support hot plugging.
- This section does not cover configuration changes in peripherals (e.g., UNIT addition or removal for a SAN disk device).
- When replacing the FC card via hot plugging, you need to consider matters in addition to the general hot plugging procedure.
- Before replacing a card in a duplication environment with PRIMECLUSTER GDS, if one of the cabinets cannot be accessed because a path duplication failure occurred, you need to disconnect the disk connected to the card from mirroring. After replacing the card, incorporate the disk connected to the card again into mirroring again.
  For details on how to disconnect a disk from and reincorporate it into mirroring, see D.8 sdxswap - Swap disk in the *PRIMECLUSTER Global Disk Services (Linux) Configuration and Administration Guide 4.3* (J2UZ-7781).
- The system restart after the failure, addition, removal, or replacement of an FC card may change the device name (/dev/sdX) assigned to each disk of the SAN disk unit.
  To prevent a device name mismatch of the disk of a SAN disk unit managed by PRIMECLUSTER GDS, a preventive measure has been implemented. To prevent a device name mismatch when directly accessing the disk of a SAN disk unit not registered with PRIMECLUSTER GDS, use the by-id name (dev/disk/by-id/...). The by-id name is not affected by FC card configuration changes.
- If all the paths in a mounted disk become hidden when an FC card is hot replaced, unmount the disk. Then, execute PHP. After PHP has been executed, a device name mismatch may occur.

FC card replacement procedure

The procedure for replacing only a faulty FC card without replacing other peripherals is as follows.
For the PRIMEQUEST 1800E, perform operations from the PSA Web-UI.

1. Make the necessary preparations.
   Stop access to the faulty FC card by stopping applications or by other such means.

   1. Log in as the system administrator (root).

2. Execute the following command to check the running status of the ServerView RAID service.

```
# /sbin/service aurad status
```

[Display example when the service is running]

```
Checking for ServerView RAID Manager: amDaemon (pid XXX) is
running...
```

(XXX indicates the process ID.)

[Display example when the service is stopped]

```
Checking for ServerView RAID Manager: amDaemon is stopped
```

3. If the ServerView RAID service is running, execute the following command to stop the service.

```
# /sbin/service aurad stop
```

2. Confirm that the PCI Hot Plug driver is installed.
   Execute the lsmod command. Confirm that the PCI Hot Plug driver module is installed.

3. If not installed, incorporate the PCI Hot Plug driver module into the system by executing the modprobe command.

```
# /sbin/modprobe pciehp
```

4. Confirm the slot number of the PCI slot.
   When replacing a PCI card, you need to manipulate the power supply to the appropriate slot, through the operating system. First, use the following procedure to obtain the slot number from the mounting location of the PCI slot for the card. It will be used to manipulate the power supply.

   1. Identify the mounting location of the PCI card to be replaced. See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be replaced.

   2. Obtain the slot number of the mounting location.
      Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is the identification information for operating the slot of the PCI card to be replaced.

5. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 4 is shown at <slot number> location in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<BUS number>_<slot number>
```

Note

<BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes. The operational target directory is defined uniquely with <slot number>.

To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

This operation concurrently removes the device associated with the relevant adapter from the system.

Note

Be sure to manipulate the power supply from the operating system.

6. Physically replace the target card.

7. Reconfigure the peripheral according to its manual.
   For example, suppose that the storage device used is ETERNUS and that the host affinity function is used (to set the access right for each server). Their settings would need to be changed as a result of FC card replacement.

8. Connect the FC card cable.

9. Power on the PCI slot.
   To enable the card again and make it available, write "1" to the "power" file in the directory corresponding to the disabled slot.

   ```
   # echo 1 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
   ```

   This operation concurrently installs the device associated with the relevant adapter on the system.

10. Confirm the incorporation results.
    Confirming the FC card incorporation results describes the confirmation method.
    Start operation with the FC card again by restarting applications as needed or by other such means.

11. Confirm the incorporation results using Web-UI of PSA.
    For details on the confirmation procedure, see How to confirm the FC card incorporation results (using Web-UI of PSA).

12. Perform the necessary post-processing.
    If you stopped the ServerView RAID service in step 1,restart the service by using the following procedure.

```
# /sbin/service aurad start
```

If you stopped any other application in step 1, restart it too as needed.

Confirming the FC card incorporation results

Confirm the incorporation results of the FC card and the corresponding driver in the following method. Then, take appropriate action.

Check the log. (The following example shows a log of FC card hot plugging.)
As shown below, the output of an FC card incorporation message and device found message as the log output to /var/log/messages after the PCI slot containing the mounted FC card is enabled means that the FC card was successfully incorporated.

```
scsi10: Emulex LPe1250-F8 8Gb PCIe Fibre Channel \
        Adapter on PCI bus 0f device 08 irq 59 ...(a)
        lpFC 0000:0f:01.0: 1:1303 Link Up Event x1 received \
        Data: x1 x1 x4 x0 ...(b)
        Vendor: FUJITSU Model: E4000 \
        Rev: 0000               ...(c-1)
        Type: Direct-Access \
        ANSI SCSI revision: 05 ...(c-2)
```

The \ at the end of a line indicates that there is no line feed.

If only the message in (a) is displayed but the next line is not displayed or if the message in (a) is not displayed, the FC card replacement itself was unsuccessful. (See Note below.) In this case, power off the slot once. Then, check the following points again:

- Whether the FC card is correctly inserted into the PCI slot
- Whether the latch is correctly set

Eliminate the problem, power on the slot again, and check the log.
If the message in (a) is displayed but the FC linkup message in (b) is not displayed, the FC cable may be disconnected or the FC path may not be set correctly. Power off the slot once.
Confirm the following points again.

- Confirm the FC driver setting.
  Confirm that the driver option of the /etc/modprobe.conf file FC driver (lpfc) is correctly set.
  For details, contact the distributor where you purchased your product, or your sales representative.
- Check the FC cable connection status.
- Confirm the Storage FC settings.
  Confirm that the settings that conform to the actual connection format (Fabric connection or Arbitrated Loop connection) were made.

Eliminate the problem, power on the slot again, and check the log.
If the messages in (a) and (b) are displayed but the messages in (c-1) and (c-2) are not displayed, the storage is not yet found.
Check the following points again. These are not card problems, so you need not power off the slot for work.

- Review FC-Switch zoning settings.

- Review storage zoning settings.
- Review storage LUN Mapping settings.
  Also, confirm that the storage can be correctly viewed from LUN0.

Eliminate the problem. Then, confirm the settings and recognize the system by using the following procedure.

1. Confirm the host number of the incorporated FC card from the message at (a).
   xx in scsixx (xx is a numerical value) in the message at (a) is a host number. In the above example, the host number is 10.

2. Scan the device by executing the following command.

```
# echo "-" "-" "-" >/sys/class/scsi_host/hostxx/scan
   (# is command prompt)

(xx in hostxx is the host number entered in step 1.)
```

   The command for the above example is as follows:

```
# echo "-" "-" "-" >/sys/class/scsi_host/host10/scan
```

3. Confirm that the messages in (c-1) and (c-2) were output to /var/log/messages.
   If this message was not output, confirm the settings again.

Note

In specific releases of RHEL, a message like (a) for confirming FC card incorporation may be output in the following format with card name information omitted.

```
scsi10 : on PCI bus 0f device 08 irq 59
```

In this case, check for the relevant message on the FC card incorporation by using the following procedure.

1. Confirm the host number.
   xx in scsixx (xx is a numerical value) in the message is a host number. In the above example, the host number is 10.

2. Check whether the following file exists by using the host number

```
/sys/class/scsi_host/hostxx/modeldesc
  (xx in hostxx is the host number entered in step 1.)
```

   If the file does not exist, the judgment is that no such message was output from the FC card.

3. If the file exists, check the file contents by using the following operation.

```
# cat /sys/class/scsi_host/hostxx/modeldesc
Emulex LPe1250-F8 8Gb PCIe Fibre Channel Adapter
```

```
(xx in hostxx is the host number entered in step 1.)
```

If the output is like the above, the judgment is that the relevant message was output by the incorporation of the FC card.

How to confirm the FC card incorporation results (using Web-UI of PSA)

1. From the Web-UI of PSA, display the Fibre Channel window.
   For details on how to display the Web-UI, see Chapter 3 PSA Web-UI (Web user interface) Operations in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

2. Confirm that all the information of the disk incorporated in the FC card is displayed in [Information about devices connected to controller] and that n.a. or - (hyphen) is not displayed for any item in the disk information.

3. Follow this step for a server in the PRIMEQUEST 1000 series. If any item is not properly displayed ([Serial No.] in FIGURE 5.1 [Fibre Channel] window (example)), restart PSA or execute the following PSA command manually.

```
/opt/FJSVpsa/sh/force_search.sh –a
```

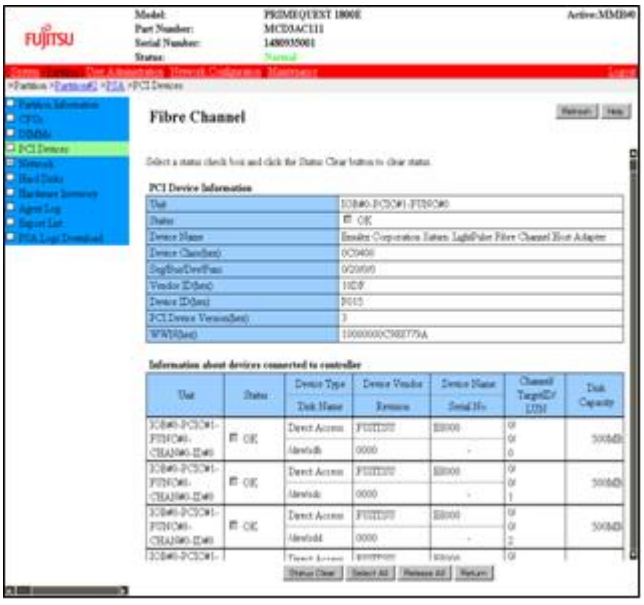

FIGURE 5.1 [Fibre Channel] window (example)

4. Click the [Refresh] button to update the window, and confirm that the information is displayed correctly.
   It takes up to three minutes to update the window.

5.1.4 Network card replacement procedure

NIC (network card) replacement using hot plugging needs specific processing before and after PCI slot power-on or power-off. Its procedure also includes to the common PCI card replacement procedure.

The procedure describes operations where a single NIC is configured as one interface. It also describes cases where multiple NICs are bonded together to configure one interface (bonding configuration).

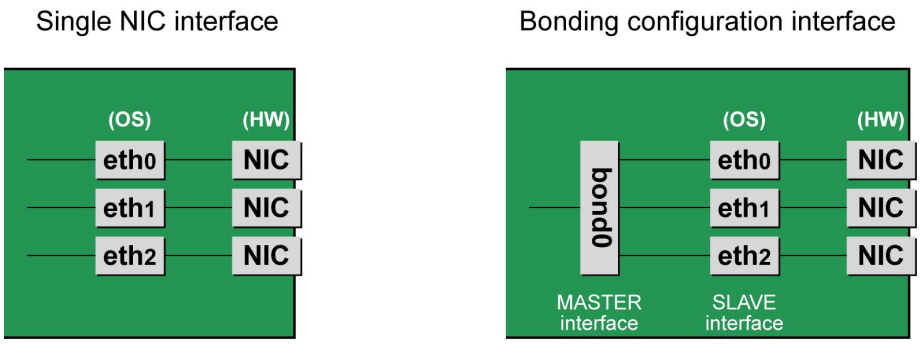

FIGURE 5.2 Single NIC interface and bonding configuration interface

NIC replacement procedure

This section describes the procedure for NIC replacement.

Notes

- When replacing multiple NICs, be sure to replace them one by one. If you replace multiple cards at the same time, they may not be correctly configured.
- To perform hot replacement in a system where a bonding device is installed, design the system so that it specifies ONBOOT=YES in all interface configuration files (the /etc/sysconfig/networkscripts/ifcfg-eth* files), regardless of whether the NIC to be replaced is a configuration interface of the bonding device.
  An IP address does not need to be assigned to unused interfaces. This procedure is for preventing the device name of the replacement target NIC from being changed after hot replacement. If ONBOOT=NO also exists, the procedure described here may not work properly.

1. Make the necessary preparations.
   If the ServerView RAID service is running, temporarily stop the service by using the following procedure.

   1. Log in as the system administrator (root).

   2. Execute the following command to check the running status of the ServerView RAID service.

```
# /sbin/service aurad status
```

   [Display example when the service is running]

```
Checking for ServerView RAID Manager: amDaemon (pid XXX) is
running...
```

   (XXX indicates the process ID.)

   [Display example when the service is stopped]

```
Checking for ServerView RAID Manager: amDaemon is stopped
```

3. If the ServerView RAID service is running, execute the following command to stop the service.

```
# /sbin/service aurad stop
```

2. Confirm that the PCI Hot Plug driver is installed.
   Execute the lsmod command. Confirm that the PCI Hot Plug driver module is installed.

```
# /sbin/lsmod | grep pciehp
pciehp                206984  0
```

   If not installed, incorporate the PCI Hot Plug driver module into the system by executing the modprobe command.

```
# /sbin/modprobe pciehp
```

3. Confirm the slot number of the PCI slot that has the mounted interface.
   Confirm the interface mounting location through the configuration file information and the operating system information. This is because the interface name used by the user may differ from that managed by the operating system.
   First, confirm the hardware address of the interface to be deleted.

```
 (Example) # grep HWADDR /etc/sysconfig/network-scripts/ifcfg-eth0

HWADDR=00:0E:0C:70:C3:38
```

   Confirm the interface name that has this hardware address. It is the name managed by the operating system.

```
 (Example) # grep -il "00:0E:0C:70:C3:38" /sys/class/net/*/address
/sys/class/net/eth0/address
```

   Now, you have the interface name managed by the operating system. Next, confirm the bus address of the PCI slot that has this mounted interface.

```
 (Example) # ls -l /sys/class/net/eth0/device
lrwxrwxrwx  1 root root 0 Sep 29 10:17  /sys/class/net/eth0/device
-> ../../../devices/pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:
01.0
```

   Excluding the rest of the directory path, check the part corresponding to the file name in the symbolic link destination file of the output results. In the above example, the underlined part shows the bus address. ("0000:0b:01" in the example)

   Check the PCI slot number for this bus address.

```
 (Example) # grep -il  0000:0b:01  /sys/bus/pci/slots/*/address

/sys/bus/pci/slots/0023_0020/address
```

Read the output file path as shown below, and confirm the PCI slot number.

```
/sys/bus/pci/slots/<BUS number>_<slot number>/address
```

Notes

- <BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes.
- If the above file path is not output, it indicates that the NIC is not mounted in a PCI slot (e.g., GbE port in the GSPB).

With the PCI slot number confirmed here, see D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers to check the mounting location, and see also B.1 Physical Mounting Locations of Components to identify the physical mounting location corresponding the PCI slot number. You can confirm that it matches the mounting location of the operational target NIC.

If the NIC has multiple interfaces, you need to deactivate all the interfaces on the NIC according to step 4. Confirm that all the interfaces that have the same bus address in a subsequent step.

Note

You will use the output in step 13. Record the executed commands and output results for later reference.

```
 (Example) # ls -l /sys/class/net/*/device | grep "0000:0b:01"
lrwxrwxrwx  1 root root 0 Sep 29 10:17 /sys/class/net/eth0/device
-> ../../../devices/pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:
01.0
lrwxrwxrwx  1 root root 0 Sep 29 10:17 /sys/class/net/eth1/device
-> ../../../devices/pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:
01.1
```

As the above example shows, when more than one interface is displayed, they are on the same NIC. If only one interface is displayed, you can skip the rest of this step. Proceed to step 4.
Confirm the hardware address from the interface name managed by the operating system.

```
 (Example) # cat /sys/class/net/eth1/address

00:0e:0c:70:c3:39
```

Confirm the interface name that has this hardware address.

```
 (Example) # grep -il "00:0e:0c:70:c3:39" /etc/sysconfig/network-
scripts/ifcfg-eth*
/etc/sysconfig/network-scripts/ifcfg-eth1
```

The above operations enable you to confirm that the interface existing on the same NIC as eth0 is eth1.

4. Deactivate the NIC.
   Execute the following command to deactivate all the interfaces that you confirmed in step 3. The applicable command depends on whether the target interface is a single NIC interface or the SLAVE interface of a bonding device.
   [For a single NIC interface]

```
# /sbin/ifdown ethX
```

   If the single NIC interface has a VLAN device, you also need to remove the VLAN interface. Perform the following operations.

```
# /sbin/ifdown ethX.Y
# /sbin/vconfig rem ethX.Y
```

   [For the SLAVE interface of a bonding device]
   Confirm that the SLAVE interface to be replaced is the interface currently being used for communication. First, confirm the interface currently being used for communication by executing the following command.

```
# cat /sys/class/net/bondY/bonding/active_slave
```

   If the displayed interface matches the SLAVE interface being replaced, execute the following command to switch the current communication interface to another SLAVE interface.

```
# /sbin/ifenslave -c bondY ethZ
```

   (ethZ: Interface that composes bondY and does not perform hot replacement)

   Finally, remove the SLAVE interface being replaced, from the bonding configuration. Immediately after being removed, the interface is automatically no longer used.

```
# /sbin/ifenslave -d bondY ethX
```

5. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used.
   Below, the slot number confirmed in step 4 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<BUS number>_<slot number>
```

Note

<BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes. The operational target directory is defined uniquely with <slot number>.

To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out. The interface (ethX) is removed at the same time.

```
# echo 0 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

6. Confirm the existing interface names.
   To confirm the interface names, execute the following command.

   Note

   You will use the output in step 13. Record the executed commands and output results for later reference.

   ```
   # /sbin/ifconfig -a
   ```

7. Replace the NIC.

8. Save the common configuration file.
   Save /etc/modprobe.conf and /etc/sysconfig/hwconf by executing the following command .

   ```
   # cp  /etc/modprobe.conf  /etc/modprobe.conf.bak
   # cp  /etc/sysconfig/hwconf  /etc/sysconfig/hwconf.bak
   ```

9. Save the interface configuration file.
   Save all the interface configuration files that you checked in step 2 by executing the following command. Kudzu and configuration scripts may reference the contents of files in /etc/sysconfig/network-scripts. For this reason, create a save directory and save these files to the directory so that kudzu and the configuration scripts will not reference them.

   ```
   # cd /etc/sysconfig/network-scripts
   # mkdir temp
   # mv  ifcfg-ethX  temp
   (following also executed for bonding configuration)
   # mv  ifcfg-bondX  temp
   ```

10. Power on the PCI slot.
    To enable the card again and make it available, write "1" to the "power" file in the directory corresponding to the disabled slot.

    ```
    # echo 1 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
    ```

This also installs the device associated with the relevant adapter on the system.

11. Collect the latest hardware information.
    A new NIC has been added. Collect the latest hardware information by executing the following command.

```
# /sbin/kudzu
```

12. Restore the saved common configuration file to the original file.
    [Restoring /etc/modprobe.conf]
    You can restore /etc/modprobe.conf to the original file.
    Restore the saved /etc/modprobe.conf to the original file by executing the following command.

```
# mv  /etc/modprobe.conf.bak  /etc/modprobe.conf
```

    [Restoring /etc/sysconfig/hwconf]
    To restore the /etc/sysconfig/hwconf file, perform the following operations.
    - In the current /etc/sysconfig/hwconf file, confirm the information area equivalent to the SLAVE interface of the bonding configuration.
      The /etc/sysconfig/hwconf file is described in the information entry format delimited by a hyphen (-) as follows.

```
-
class: NETWORK
bus: PCI
detached: 0
device: ethX                          ← Interface name
      :
network.hwaddr: 00:00:00:11:11:11      ← Varies depending on NIC
      :
pcidev: *
pcifn: *
-
```

      Confirm that the "device:" line has the entry of the SLAVE interface name of the bonding configuration.

    - Restore the entries of all the SLAVE interfaces other than the hot-replaced SLAVE interface from the saved /etc/sysconfig/hwconf.bak.
      The kudzu command executed in step 11 may rewrite the entries corresponding to the SLAVE interfaces of the bonding configuration in /etc/sysconfig/hwconf (i.e., an invalid value may be set in the MAC address). This symptom may occur if a bonding device is installed in the system irrespective of whether the interface to be replaced is an interface under bonding.
      The SLAVE interfaces that can be rewritten are interfaces other than the hot-replaced interface. Edit and restore the entries of the /etc/sysconfig/hwconf files of SLAVE interfaces other than the hot-replaced interface based on the same entries of the saved /etc/sysconfig/hwconf.bak. (No action is required for unchanged entries.)

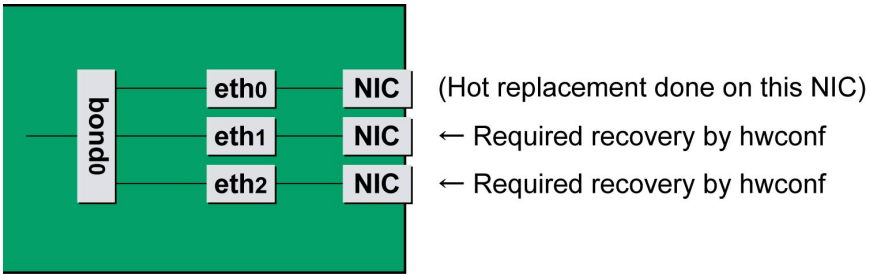

FIGURE 5.3 Required interface recovery example 1

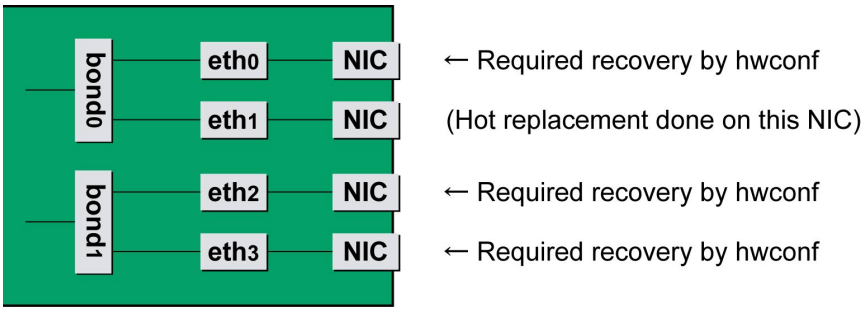

FIGURE 5.4 Required interface recovery example 2

13. Confirm the hardware address.
    Powering on the slot creates an interface (ethX) for the replaced NIC. Execute the following command. Compare its results with those of step 6 to confirm the created interface name.

```
# /sbin/ifconfig -a
```

    Confirm the hardware address (HWaddr) of the replaced interface by executing the ifconfig command. For a single NIC with multiple interfaces, confirm the hardware addresses of all the interfaces.

```
 (Example) # /sbin/ifconfig -a
…

eth0      Link encap:Ethernet  HWaddr 00:0E:0C:70:C3:40
          BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
          Memory:8ab00000-8ab20000


eth1      Link encap:Ethernet  HWaddr 00:0E:0C:70:C3:41
          BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
```

```
          Memory:8ab20000-8ab40000
…
```

As a result of the above confirmation, if the interface name changes before or after one NIC is replaced (this may occur if a configuration file with ONBOOT=NO exists), you need to perform step 3 again to take the correspondence between slot mounting locations and slot numbers and confirm the correct MAC address of the replaced NIC. You also need to confirm this MAC address if two or more NICs are replaced at the same time.

Based on the bus address confirmed in step 3 (e.g., "000:0b:01"), confirm the interface again by executing the following command.

```
 (Example) # ls -l /sys/class/net/*/device | grep "0000:0b:01"
lrwxrwxrwx  1 root root 0 Sep 29 10:17 /sys/class/net/eth0/device
-> ../../../devices/pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:
01.0
lrwxrwxrwx  1 root root 0 Sep 29 10:17 /sys/class/net/eth1/device
-> ../../../devices/pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:
01.1
```

If the results displayed here match the displayed results of step 3, it means that the interface name was not replaced for the physical device. In this example, there is no problem, so you can use 00:0E:0C:70:C3:40.

If the results displayed here do not match the displayed results of step 3 as shown below, it means that the interface name was replaced for the physical device. In that example, you will need to use 00:0E:0C:70:C3:41.

```
 (Example) # ls -l /sys/class/net/*/device | grep "0000:0b:01"
lrwxrwxrwx  1 root root 0 Sep 29 10:17 /sys/class/net/eth1/device
-> ../../../devices/pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:
01.0
lrwxrwxrwx  1 root root 0 Sep 29 10:17 /sys/class/net/eth0/device
-> ../../../devices/pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:
01.1
```

Record the correspondence between the interface names and hardware addresses confirmed here so that they can be referenced later because you will uses them in step 15.

14. Restore the saved interface configuration file to the original file.
    Restore the interface configuration file saved to the save directory to the original file by executing the following command.

```
# cd /etc/sysconfig/network-scripts/temp
# mv  ifcfg-ethX  ..
(following also executed for bonding configuration)
# mv  ifcfg-bondX  ..
```

If a /etc/sysconfig/network-scripts/ifcfg-ethX.bak file is created by kudzu, delete the file. This operation is not essential.

15. Edit the interface configuration file.
    Rewrite the old hardware address with a new hardware address. In "HWADDR," set the hardware address confirmed in step 13. Also, for SLAVE under bonding, the file contents are partly different, but the lines to be set are the same.

```
(Example)
DEVICE=eth0
BOOTPROTO=static
HWADDR=00:0E:0C:70:C3:40
BROADCAST=192.168.16.255
IPADDR=192.168.16.1
NETMASK=255.255.255.0
NETWORK=192.168.16.0
ONBOOT=yes
TYPE=Ethernet
```

16. Activate the replaced interface.
    The method for activating a single NIC interface differs from that for activating the SLAVE interfaces under bonding.
    [For a single NIC interface]
    Execute the following command to activate the interface. Activate all the necessary interfaces.

```
# /sbin/ifup ethX
```

    Also, if the single NIC interface has a VLAN device and the VLAN interface was temporarily removed, restore the VLAN interface. If the priority option has changed, set it again.

```
# /sbin/vconfig add ethX Y
# /sbin/ifup ethX.Y
 (enter command to set VLAN option as needed)
```

    [For SLAVE under bonding]
    Execute the following command to activate the interface. Activate all the necessary interfaces.

```
# /sbin/ifenslave bondY ethX
```

    Note
    The ifup command has a function that assigns the correct ethX according to the MAC address, but the ifenslave command does not have that function. If the same name as before the replacement is assigned to the NIC replaced in step 13, only the ifenslave command will encounter no problems. If the assignment is changed, however, you need to correctly assign the NIC.

The ifup command for activating single NIC interfaces also has the capability to assign interface names according to the interface configuration file (ifcfg-ethX file). However, the ifenslave command for activating bonding interfaces does not have this capability.
Therefore, add a SLAVE interface by using the following procedure:

- Temporarily start and stop the NIC that was added as a single NIC interface.
- Reconfigure it as a SLAVE interface. Incorporate it into the bonding configuration.

First, temporarily configure the SLAVE interface of bonding alone. Comment out the lines (MASTER, SLAVE) related to bonding in the contents of the configuration file created in step 15. The corresponding lines in the following example are "#MASTER=bondY" and "#SLAVE=YES".

```
DEVICE=ethX
#MASTER=bondY
#SLAVE=YES
ONBOOT=YES
        Omitted
```

Execute the following command under the above-described conditions.

```
# /sbin/ifup ethX
# /sbin/ifdown ethX
```

Now, the correct name has been assigned.

Next, edit the configuration file to restore the lines that were commented out. The corresponding lines in the following example are "MASTER=bondY" and "SLAVE=YES".

```
DEVICE=ethX
MASTER=bondY
SLAVE=YES
ONBOOT=YES
        Omitted
```

Finally, execute the following command to incorporate the SLAVE interface into the bonding configuration. Incorporate all the necessary interfaces into the bonding configuration.

```
# /sbin/ifenslave bondY ethX
```

To perform this operation for more than one interface, execute the ifup command and the ifdown command in succession on all interfaces. At this time, the ifup command may fail to execute. In such case, skip the interface once, and execute the ifup and ifdown commands on the other interfaces. Then, retry executing the ifup and ifdown commands again on the failed interface.

17. Remove the directory to which the interface configuration file was saved.

After all the interfaces to be replaced have been replaced, remove the save directory created in step 9 by executing the following command.

```
# rmdir /etc/sysconfig/network-scripts/temp
```

18. Perform the necessary post-processing.
    If you stopped the ServerView RAID service in step 1, restart the service by using the following procedure.

```
# /sbin/service aurad start
```

5.1.5 Assigning a fixed interface name to a NIC

Under normal operation in Red Hat Enterprise Linux 5, a NIC interface name may change as another NIC is mounted or unmounted. This is because NIC interface names are created specifying the order that hardware is detected. In such an event, unexpected problems will occur in programs that directly use interface names.
One method to prevent this problem is to set fixed NIC interface names. This section describes how to do so.

Describing a MAC address in the interface configuration file

A MAC address is a unique six-byte hardware-specific address assigned to each NIC.
The interface configuration file is used to configure a network interface (e.g., eth0). This file is created in the /etc/sysconfig/network-scripts directory under the file name ifcfg-*interface name*.
To fix a NIC interface name, define the NIC hardware address (MAC address) in the interface configuration file. Specifically, describe the following line in the ifcfg-*interface name* file.

HWADDR=MAC address

The following example assigns the eth0 interface name to the NIC where the MAC address is "00:0E:0C:70:C3:40". Interface names can be fixed only for the activated interfaces. To fix an interface name when starting the system, describe ONBOOT=yes.

```
 (Example)
DEVICE=eth0                          ....Interface name
BOOTPROTO=static
HWADDR=00:0E:0C:70:C3:40          ....Hardware address
BROADCAST=192.168.16.255
IPADDR=192.168.16.1
NETMASK=255.255.255.0
NETWORK=192.168.16.0
ONBOOT=yes
TYPE=Ethernet
```

This file is automatically read when the interface is activated. For this reason, you need to describe the hardware address before the interface is activated.
You also need to describe the interface name before the interface is activated.

Corrective action for the kudzu utility (when replacing a NIC card)

The utility (kudzu) for checking for hardware changes may be executed in the system reboot after NIC replacement. Take corrective action by using the following procedure.

1. In a window displayed by kudzu, select whether to delete the device information for the removed interface from the system. (Confirm the displayed contents.)

2. Leave device information as is in the system because it is used by the interface. The choices are [Remove Configuration], [Keep Configuration], and [Do Nothing]. Select [Keep Configuration].

3. Then, a window appears that asks whether to add device information for the added interface to the system. The choices are [Configure], [Ignore], and [Do Nothing]. Select [Ignore].

5.1.6 Hot replacement procedure for iSCSI (NIC)

When performing hot replacement of NICs used for iSCSI connection, use the following procedures.

5.1.1 Overview of common replacement procedures for all PCI cards

5.1.2 PCI card replacement procedure in detail

5.1.4 Network card replacement procedure

5.1.5 Assigning a fixed interface name to a NIC

A supplementary explanation of the procedure follows.

Prerequisites for iSCSI (NIC) hot replacement

The prerequisites for iSCSI (NIC) hot replacement are as follows.

- The storage connection is established on a multipath using DM-MP (Device-Mapper Multipath) or ETERNUS multidriver (EMPD).
- To replace more than one iSCSI card, one card at a time will be replaced.
- A single NIC is configured as one interface.

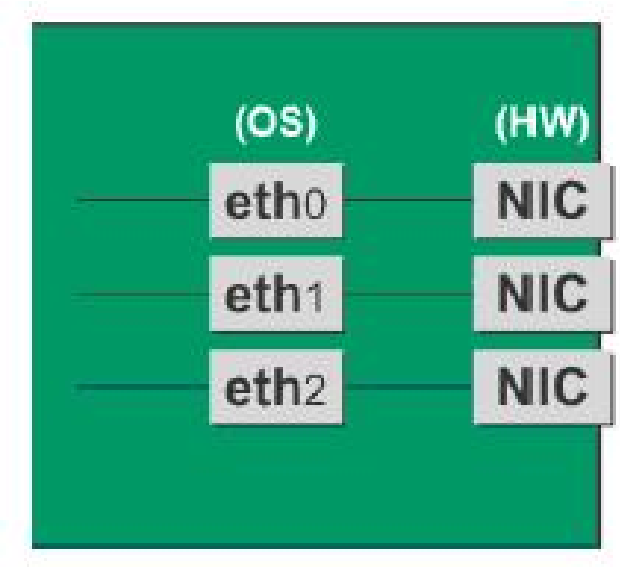

FIGURE 5.5 Example of single NIC interface

Work to be performed before NIC replacement

For iSCSI (NIC) hot replacement, be sure to follow the procedure below immediately before performing Step 4 of the NIC replacement procedure in 5.1.4 Network card replacement procedure.

1. Perform the work for suppressing access to the iSCSI connection interface.
    1. Use the iscsiadm command to log out from the path (iqn) through which the iSCSI card to be replaced is routed, and disconnect the session.
    2. Use the iscsiadm command to confirm that the target session has been disconnected. You can confirm the disconnection of sessions on multipath products using DM-MP (*1) or ETERNUS multidriver (*2).
       *1: Write down the DM-MP display contents at the session disconnection.
       *2: See the ETERNUS Multipath Driver User's Guide (For Linux).

Work to be performed after NIC replacement

For iSCSI (NIC) hot replacement, be sure to follow the procedure below immediately before performing Step 18 of the NIC replacement procedure in 5.1.4 Network card replacement procedure.

1. To restore access to the iSCSI connection interface, perform the following.
    1. Use the iscsiadm command to log in to the path (iqn) through which the replacement iSCSI card is routed, and reconnect the session.
    2. Use the iscsiadm command to confirm that the target session has been activated. You can confirm the activation of sessions on multipath products using DM-MP (*1) or ETERNUS multidriver (*2).
       *1: Write down the DM-MP display contents at the session activation.
       *2: See the *ETERNUS Multipath Driver User's Guide (For Linux)*.

5.2 Hot Addition of PCI Cards

This section describes the PCI card addition procedure with the PCI Hot Plug function.
The procedure includes common steps for all PCI cards and the additional steps required for a specific card function or driver.
Thus, the descriptions cover both the common operations required for all cards (e.g., power supply operations) and the specific procedures required for certain types of card. For details on addition of the cards not described in this section, see the respective product manuals.

5.2.1 Common addition procedures for all PCI cards

1. Performing the required operating system and software operations depending on the PCI card type
2. Confirming the installation of the Hot Plug driver: See Confirming the installation of the PCI Hot Plug driver
3. Confirming that the PCI slot power is off: See Powering on and off PCI slots
4. Adding a PCI card
5. Powering on a PCI slot: See Powering on and off PCI slots
6. Performing the required operating system and software operations depending on the PCI card type

Notes

- This section describes instructions for the operating system and subsystems (e.g., commands, configuration file editing). Be sure to refer to the respective product manuals to confirm the command syntax and impact on the system before performing tasks with those instructions.
- For hot replacement of a PCI card, the ServerView RAID service need not be temporarily stopped.

The following sections describe card addition with the required instructions (e.g., commands, configuration file editing) for the operating system and subsystems, together with the actual hardware operations.

5.2.2 PCI card addition procedure in detail

This section describes operations that must be performed in the PCI card addition procedure.

Confirming the installation of the PCI Hot Plug driver

The Hot Plug driver must be installed on the system before you Hot Plug individual cards.

Hot plug driver module for PCI Express cards: pciehp

Confirm the installation of the Hot Plug driver by using the following procedure.

1. Execute the lsmod command. Confirm that the PCI Hot Plug driver module is installed.

```
# /sbin/lsmod | grep pciehp
pciehp                206984  0
```

2. If not installed, incorporate the PCI Hot Plug driver module into the system by executing the modprobe command.

```
# /sbin/modprobe pciehp
```

Executing the modprobe command automatically incorporates all relevant modules into the kernel.

Confirming the slot number of a PCI slot

When adding a PCI card, you need to manipulate the power supply to the appropriate slot, through the operating system. First, use the following procedure to obtain the BUS number and slot number from the physical location of the PCI slot for the card. It will be used to manipulate the power supply.

1. Identify the mounting location of the PCI card to be added.
   See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be added.
2. Obtain the slot number of the mounting location.
   Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be added.

Checking the power status of a PCI slot

Using the PCI slot number confirmed in Confirming the slot number of a PCI slot, confirm that the /sys/bus/pci/slots directory contains a directory for this slot information, which will be referenced and otherwise used. Below, the PCI slot number confirmed in Confirming the slot number of a PCI slot is shown at <slot number> location in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<BUS number>_<slot number>
```

Note

<BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes. The operational target directory is defined uniquely with <slot number>.

Confirm that the PCI card in the slot is enabled or disabled by displaying the "power" file contents in this directory.

```
# cat /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

When displayed, "0" means disabled, and "1" means enabled.

Powering on and off PCI slots

You can power on and off a PCI slot through an operation on the file confirmed in Checking the power status of a PCI slot.
To disable a slot and make it ready for the addition of a PCI card, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

Note
Be sure to manipulate the power supply from the operating system.

After the PCI card is added to the target slot, to enable the target slot and make it ready for use, write "1" to the "power" file in the directory corresponding to the target slot.

```
# echo 1 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

This also installs the device associated with the relevant adapter on the system.

Note
After power-on, you need to confirm that the card and driver are correctly installed. The procedures vary depending on the card and driver specifications. For the appropriate procedures, see the respective manuals.

5.2.3 FC card (Fibre Channel card) addition procedure

The descriptions in this section assume that an FC card is being added.

Notes

- The FC card used for SAN boot does not support hot plugging.
- This section does not cover configuration changes in peripherals (e.g., UNIT addition or removal for a SAN disk device).
- When adding the FC card via hot plugging, you need to consider other matters in addition to the general hot plugging procedure.
- The system restart after the failure, addition, removal, or replacement of an FC card may change the device name (/dev/sdX) assigned to each disk of the SAN disk unit.
  To prevent a device name mismatch of the disk of a SAN disk unit managed by PRIMECLUSTER GDS, a preventive measure has been implemented. To prevent a device name mismatch when directly accessing the disk of a SAN disk unit not registered with PRIMECLUSTER GDS, use the by-id name (dev/disk/by-id/...). The by-id name is not affected by FC card configuration changes.

FC card addition procedure

The procedure for adding new FC cards and peripherals is as follows.

1. Confirm that the PCI Hot Plug driver is installed.
   Execute the lsmod command. Confirm that the PCI Hot Plug driver module is installed.

   ```
   # /sbin/lsmod | grep pciehp
   pciehp                206984  0
   ```

   If not installed, incorporate the PCI Hot Plug driver module into the system by executing the modprobe command.

```
# /sbin/modprobe pciehp
```

2. Confirm the slot number of the PCI slot by using the following procedure.
    1. Identify the mounting location of the PCI card to be added.
       See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be added.
    2. Obtain the slot number of the mounting location.
       Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be added.

3. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 2 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<BUS number>_<slot number>
```

   Note
   <BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes. The operational target directory is defined uniquely with <slot number>.

   To disable a slot and make it ready for the addition of a PCI card, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

   Note
   Be sure to manipulate the power supply from the operating system.

4. Physically add the target card.

5. Reconfigure the peripheral according to its manual.
   For example, suppose that the storage device used is ETERNUS and that the host affinity function is used (to set the access right for each server). Their settings would need to be changed as a result of FC card replacement.

6. Connect the FC card cable.

7. Power on the PCI slot.
   To enable the target slot and make it ready for use, write "1" to the "power" file in the directory corresponding to the slot of the added PCI card.

```
# echo 1 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

This also installs the device associated with the relevant adapter on the system.

8. Confirm the incorporation results.
   The contents of this confirmation method are the same as those of the confirmation method in the FC card replacement procedure. See Confirming the FC card incorporation results.

9. Confirm the incorporation results using Web-UI of PSA.
   The confirmation procedure is the same as the procedure performed for the replacement of the FC card. See How to confirm the FC card incorporation results (using Web-UI of PSA).

5.2.4 Network card addition procedure

NIC (network card) addition using hot plugging needs specific processing before and after PCI slot power-on or power-off. Its procedure also includes the common PCI card addition procedure.
The procedure describes operations where a single NIC is configured as one interface. It also describes cases where multiple NICs are bonded together to configure one interface (bonding configuration).

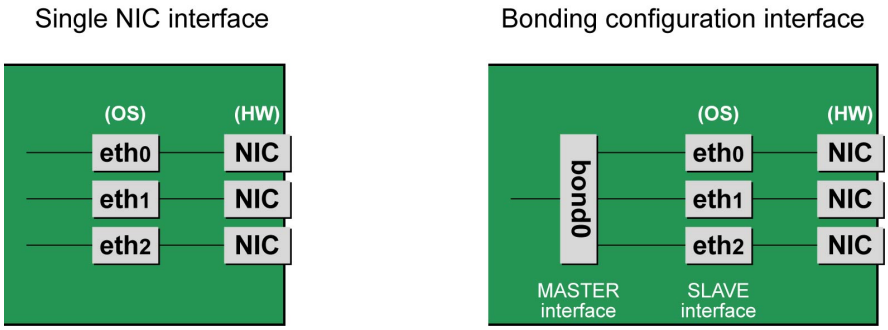

FIGURE 5.6 Single NIC interface and bonding configuration interface

NIC addition procedure

This section describes the procedure for hot plugging only a network card.

Note

When adding multiple NICs, be sure to add them one by one. If you do this with multiple cards at the same time, the correct settings may not be made.

1. Confirm that the PCI Hot Plug driver is installed.
   Execute the lsmod command. Confirm that the PCI Hot Plug driver module is installed.

```
# /sbin/lsmod | grep pciehp
pciehp                206984  0
```

If not installed, incorporate the PCI Hot Plug driver module into the system by executing the modprobe command.

```
# /sbin/modprobe pciehp
```

2. Confirm the existing interface names.
   To confirm the interface names, execute the following command.

```
# /sbin/ifconfig -a
```

3. Confirm the slot number of the PCI slot containing an interface by using the following procedure.
   1. Identify the mounting location of the PCI card to be added.
      See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be added.
   2. Obtain the slot number of the mounting location.
      Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be added.

4. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 3 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<BUS number>_<slot number>
```

   Note
   <BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes. The operational target directory is defined uniquely with <slot number>.

   To disable a slot and make it ready for the addition of a PCI card, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

   Note
   Be sure to manipulate the power supply from the operating system.

5. Add the NIC to the PCI slot.

6. Power on the PCI slot.
   To enable a PCI card and make it ready for use, write "1" to the "power" file in the directory corresponding to the slot to which the PCI card is added. The interface (ethX) is added at the same time.

```
# echo 1 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

7. Confirm the newly added interface name.
   Powering on the slot creates an interface (ethX) for the added NIC. Execute the following command. Compare its results with those of step 2 to confirm the created interface name.

```
# /sbin/ifconfig -a
```

8. Confirm the hardware address of the newly added interface.
   Confirm the hardware address (HWaddr) of the created interface by executing the ifconfig command. For a single NIC with multiple interfaces, confirm the hardware addresses of all the created interfaces.
   In the following example, dev32084 and eth0 are respectively assigned as the dummy interface name.

```
 (Example) # /sbin/ifconfig -a
…
dev32084  Link encap:Ethernet  HWaddr 00:0E:0C:70:C3:41
          BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
          Memory:8ab20000-8ab40000

eth0      Link encap:Ethernet  HWaddr 00:0E:0C:70:C3:40
          BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
          Memory:8ab00000-
…
```

9. Create an interface configuration file.
   Set the interface configuration file (/etc/sysconfig/network-scripts/ifcfg-ethX) as follows. In "HWADDR," set the hardware address confirmed in step 8.
   If multiple NICs are added or if a NIC where multiple interfaces exist is added, create a file for all the interfaces.
   The contents differ slightly depending on whether the interface is a single NIC interface or a SLAVE interface of the bonding configuration.
   [For a single NIC interface]

```
(Example)
DEVICE=eth0     ←Specified interface name confirmed in step 7
BOOTPROTO=static
HWADDR=00:0E:0C:70:C3:40
BROADCAST=192.168.16.255
```

```
IPADDR=192.168.16.1
NETMASK=255.255.255.0
NETWORK=192.168.16.0
ONBOOT=yes
TYPE=Ethernet
```

[SLAVE interface of the bonding configuration]

```
(Example)
DEVICE=eth0     ←Specified interface name confirmed in step 7
BOOTPROTO=static
HWADDR=00:0E:0C:70:C3:40
MASTER=bondY
SLAVE=yes
ONBOOT=yes
```

Adding the bonding interface itself also requires the MASTER interface configuration file of the bonding configuration.

Note
The interface configuration file is required for automatically activating the interface when the system is started.

10. Add the added interface to the /etc/modprobe.conf file.
    This associates the interface with the driver. The following example shows /etc/modprobe.conf contents.

```
(Example)
alias eth1 e1000e
alias eth2 igb
alias eth3 igb
alias eth4 igb
alias eth5 igb
alias eth6 igb
alias eth7 igb
alias eth8 igb
alias eth9 igb
alias eth10 e1000e
alias eth11 e1000e
alias scsi_hostadapter mptbase
alias scsi_hostadapter1 mptscsih
alias usb-controller ehci-hcd
alias usb-controller1 uhci-hcd
alias scsi_hostadapter2 lpfc
alias eth0 e1000e   ← Added
```

To add the bonding interface itself, you need to also add the device driver configuration to the bonding device. Add the following to the /etc/modprobe.conf file.

```
alias bondY bonding
```

bondY: Name of the new bonding interface to be added

You can also specify an option for the bonding driver.

11. Activate the added interface.
    Execute the following command to activate the interface. Activate all the necessary interfaces. The activation method depends on the configuration.
    [For a single NIC interface]
    Execute the following command to activate the interface. Activate all the necessary interfaces.

```
# /sbin/ifup ethX
```

    [For the bonding configuration]
    To add the SLAVE interface when the bonding device is already installed, you need to incorporate the SLAVE interface into the bonding interface and assign the correct interface name.
    The ifup command for activating single NIC interfaces also has the capability to assign interface names according to the interface configuration file (ifcfg-ethX file). However, the ifenslave command for activating bonding interfaces does not have this capability.
    Therefore, add a SLAVE interface by using the following procedure:
    - Temporarily start and stop the NIC that was added as a single NIC interface.
    - Reconfigure it as a SLAVE interface. Incorporate it into the bonding configuration.

    First, temporarily configure the SLAVE interface of bonding alone. Comment out the lines (MASTER, SLAVE) related to bonding in the contents of the configuration file created in step 9. The corresponding lines in the following example are "#MASTER=bondY" and "#SLAVE=YES".

```
DEVICE=ethX
#MASTER=bondY
#SLAVE=YES
ONBOOT=YES
        (Omitted)
```

    Execute the following command under the above-described conditions.

```
# /sbin/ifup ethX
# /sbin/ifdown ethX
```

    Now, the correct name has been assigned.

Next, edit the configuration file to restore the lines that were commented out. The corresponding lines in the following example are "MASTER=bondY" and "SLAVE=YES".

```
DEVICE=ethX
MASTER=bondY
SLAVE=YES
ONBOOT=YES
        (Omitted)
```

Finally, execute the following command to incorporate the SLAVE interface into the bonding configuration. Incorporate all the necessary interfaces into the bonding configuration.

```
# /sbin/ifenslave bondY ethX
```

To perform this operation for more than one interface, execute the ifup command and the ifdown command in succession on all interfaces. At this time, the ifup command may fail to execute. In such case, skip the interface once, and execute the ifup and ifdown commands on the other interfaces. Then, retry executing the ifup and ifdown commands again on the failed interface.
To add the bonding device together with SLAVE, activate the interface by executing the following command. In this case, no individual operation is required for SLAVE.

```
# /sbin/ifup bondY
```

5.2.5 Assigning a fixed interface name to a NIC

For hot plugging, the interface must be assigned a fixed interface name.
The contents of this procedure are the same as those in the NIC card replacement procedure.
See 5.1.5 Assigning a fixed interface name to a NIC.

Corrective action for the kudzu utility (when adding a NIC card)

The utility (kudzu) for checking for hardware changes may be executed in the system reboot after NIC addition. Take corrective action by using the following procedure.

- In a window displayed by kudzu, select whether to add the device information for the added interface to the system. (Confirm the displayed contents.)
- The device information is added to the system when an interface is added. The choices are [Configure], [Ignore], and [Do Nothing]. Select [Ignore].

5.3 Removing PCI Cards

This section describes the PCI card removal procedure with the PCI Hot Plug function.
The procedure includes common steps for all PCI cards and the additional steps required for a specific card function or driver.
Thus, the descriptions cover both the common operations required for all cards (e.g., power supply operations) and the specific procedures required for certain types of card. For details on removal of the cards not described in this section, see the respective product manuals.

5.3.1 Common removal procedures for all PCI cards

1. Performing the required operating system and software operations depending on the PCI card type
2. Confirming the installation of the Hot Plug driver: See Confirming the installation of the PCI Hot Plug driver
3. Confirming that the PCI slot power is off: See Powering off a PCI slot
4. Removing a PCI card
5. Performing the required operating system and software operations depending on the PCI card type

Note
This section describes instructions for the operating system and subsystems (e.g., commands, configuration file editing). Be sure to refer to the respective product manuals to confirm the command syntax and impact on the system before performing tasks with those instructions.

The following sections describe card removal with the required instructions (e.g., commands, configuration file editing) for the operating system and subsystems, together with the actual hardware operations.

5.3.2 PCI card removal procedure in detail

This section describes operations that must be performed in the PCI card removal procedure.

Stopping the ServerView RAID service

When hot removal of a PCI card is performed while the ServerView RAID service is running, a system panic may occur. For this reason, before starting hot removal, temporarily stop the ServerView RAID service by using the following procedure.
Note that this work is not required if you are using any of the following versions.

- Red Hat Enterprise Linux 5.8 or later
- Red Hat Enterprise Linux 5.7 and kernel-2.6.18-274.7.1.el5, or later version
- Red Hat Enterprise Linux 5.6 and kernel-2.6.18-238.27.1.el5, or later version
- Red Hat Enterprise Linux 5.3 and kernel-2.6.18-128.35.1.el5, or later version

1. Log in as the system administrator (root).
2. Execute the following command to check the running status of the ServerView RAID service.

```
# /sbin/service aurad status
```

[Display example when the service is running]

```
Checking for ServerView RAID Manager: amDaemon (pid XXX) is
running...
```

(XXX indicates the process ID.)

[Display example when the service is stopped]

```
Checking for ServerView RAID Manager: amDaemon is stopped
```

3. If the ServerView RAID service is running, execute the following command to stop the service.

```
# /sbin/service aurad stop
```

Confirming the installation of the PCI Hot Plug driver

The Hot Plug driver must be installed on the system before you Hot Plug individual cards.
The method for installing the Hot Plug driver and confirming the installation is the same as in the PCI card replacement procedure.

- Hot plug driver module for PCI Express cards: pciehp

Confirm the installation of the Hot Plug driver by using the following procedure.

1. Execute the lsmod command. Confirm that the PCI Hot Plug driver module is installed.

```
# /sbin/lsmod | grep pciehp
pciehp                206984  0
```

2. If not installed, incorporate the PCI Hot Plug driver module into the system by executing the modprobe command.

```
# /sbin/modprobe pciehp
```

Executing the modprobe command automatically incorporates all relevant modules into the kernel.

Confirming the slot number of a PCI slot

When removing a PCI card, you need to manipulate the power supply to the appropriate slot, through the operating system. First, use the following procedure to obtain the BUS number and slot number from the physical location of the PCI slot for the card. It will be used to manipulate the power supply.

1. Identify the mounting location of the PCI card to be removed.
   See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be removed.
2. Obtain the slot number of the mounting location.

Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers , and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be removed.

Checking the power status of a PCI slot

Using the PCI slot number confirmed in Confirming the slot number of a PCI slot, confirm that the /sys/bus/pci/slots directory contains a directory for this slot information, which will be referenced and otherwise used. Below, the slot number is shown at <slot number> location in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<BUS number>_<slot number>
```

Note

<BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes. The operational target directory is defined uniquely with <slot number>.

Confirm that the PCI card in the slot is enabled or disabled by displaying the "power" file contents in this directory.

```
# cat /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

When displayed, "0" means disabled, and "1" means enabled.

Powering off a PCI slot

You can power off a PCI slot through an operation on the file confirmed in Checking the power status of a PCI slot.

To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

This concurrently removes the device associated with the relevant adapter from the system.

Note

Be sure to manipulate the power supply from the operating system.

Restarting the ServerView RAID service

If the ServerView RAID service was stopped before the start of hot removal work on a PCI card, restart the service by using the following procedure after the hot removal work.

1. Log in as the system administrator (root).
2. Execute the following command to restart the ServerView RAID service.

```
# /sbin/service aurad start
```

5.3.3 FC card (Fibre Channel card) removal procedure

The descriptions in this section assume that an FC card is being removed.

Notes

- The FC card used for SAN boot does not support hot plugging.
- This section does not cover configuration changes in peripherals (e.g., UNIT addition or removal for a SAN disk device).
- When removing the FC card via hot plugging, you need to consider other matters in addition to the general hot plugging procedure.
- The system restart after the failure, addition, removal, or replacement of an FC card may change the device name (/dev/sdX) assigned to each disk of the SAN disk unit.
  To prevent a device name mismatch of the disk of a SAN disk unit managed by PRIMECLUSTER GDS, a preventive measure has been implemented. To prevent a device name mismatch when directly accessing the disk of a SAN disk unit not registered with PRIMECLUSTER GDS, use the by-id name (dev/disk/by-id/...). The by-id name is not affected by FC card configuration changes.

FC card removal procedure

The procedure for removing an FC card and peripherals is as follows.

1. Make the necessary preparations.
   Stop access to the FC card by stopping applications or by other such means.
   If the ServerView RAID service is running, temporarily stop the service by using the following procedure.

   1. Log in as the system administrator (root).

   2. Execute the following command to check the running status of the ServerView RAID service.

      ```
      # /sbin/service aurad status
      ```

      [Display example when the service is running]

      ```
      Checking for ServerView RAID Manager: amDaemon (pid XXX) is
      running...
      ```

      (XXX indicates the process ID.)

      [Display example when the service is stopped]

      ```
      Checking for ServerView RAID Manager: amDaemon is stopped
      ```

   3. If the ServerView RAID service is running, execute the following command to stop the service.

      ```
      # /sbin/service aurad stop
      ```

2. Confirm that the PCI Hot Plug driver is installed.

Execute the lsmod command. Confirm that the PCI Hot Plug driver module is installed.

```
# /sbin/lsmod | grep pciehp
pciehp                206984  0
```

If not installed, incorporate the PCI Hot Plug driver module into the system by executing the modprobe command.

```
# /sbin/modprobe pciehp
```

3. Confirm the slot number of the PCI slot by using the following procedure.
    1. Identify the mounting location of the PCI card to be removed.
       See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be removed.
    2. Obtain the slot number of the mounting location.
       Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be removed.

4. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 3 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<BUS number>_<slot number>
```

Note
<BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes. The operational target directory is defined uniquely with <slot number>.

To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

This concurrently removes the device associated with the relevant adapter from the system.

Note
Be sure to manipulate the power supply from the operating system.

5. Physically remove the target card.

6. Perform the necessary post-processing.

If you stopped the ServerView RAID service in step 1, restart the service by using the following procedure.

```
# /sbin/service aurad start
```

If you stopped any other application in step 1, restart it too as needed.

5.3.4 Network card removal procedure

NIC (network card) removal using hot plugging needs specific processing before and after PCI slot power-on or power-off. Its procedure also includes the common PCI card removal procedure.
The procedure describes operations where a single NIC is configured as one interface. It also describes cases where multiple NICs are bonded together to configure one interface (bonding configuration).

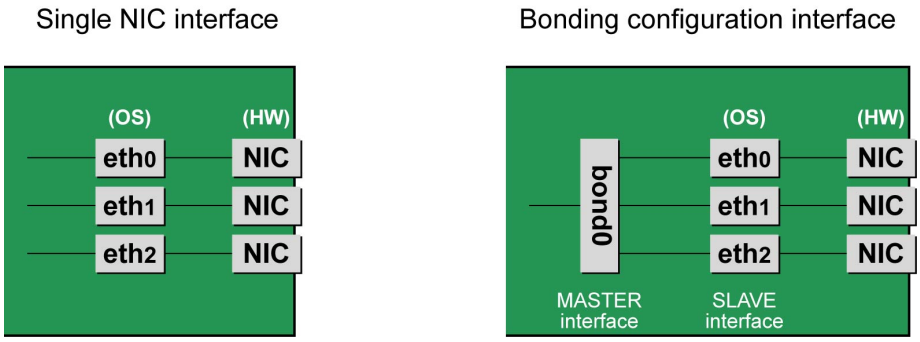

FIGURE 5.7 Single NIC interface and bonding configuration interface

NIC removal procedure

This section describes the procedure for hot plugging only a network card.

Note

When removing multiple NICs, be sure to remove them one by one. If you do this with multiple cards at the same time, the correct settings may not be made.

1. Make the necessary preparations.
   If the ServerView RAID service is running, temporarily stop the service by using the following procedure.

   1. Log in as the system administrator (root).

   2. Execute the following command to check the running status of the ServerView RAID service.

      ```
      # /sbin/service aurad status
      ```

      [Display example when the service is running]

      ```
      Checking for ServerView RAID Manager: amDaemon (pid XXX) is
      running...
      ```

(XXX indicates the process ID.)

[Display example when the service is stopped]

```
Checking for ServerView RAID Manager: amDaemon is stopped
```

3. If the ServerView RAID service is running, execute the following command to stop the service.

```
# /sbin/service aurad stop
```

2. Confirm that the PCI Hot Plug driver is installed.
   Execute the lsmod command. Confirm that the PCI Hot Plug driver module is installed.

```
# /sbin/lsmod | grep pciehp
pciehp                206984  0
```

   If not installed, incorporate the PCI Hot Plug driver module into the system by executing the modprobe command.

```
# /sbin/modprobe pciehp
```

3. Confirm the slot number of the PCI slot that has the mounted interface.
   Confirm the interface mounting location through the configuration file information and the operating system information. This is because the interface name used by the user may differ from that managed by the operating system.
   First, confirm the hardware address of the interface to be deleted.

```
 (Example) # grep HWADDR /etc/sysconfig/network-scripts/ifcfg-eth0

HWADDR=00:0E:0C:70:C3:40
```

   Confirm the interface name that has this hardware address. It is the name managed by the operating system.

```
 (Example) # grep -il "00:0E:0C:70:C3:40" /sys/class/net/*/address
/sys/class/net/eth0/address
```

   Now, you have the interface name managed by the operating system. Next, confirm the bus address of the PCI slot that has this mounted interface.

```
 (Example) # ls -l /sys/class/net/eth0/device
lrwxrwxrwx  1 root root 0 Sep 29 09:26
                  /sys/class/net/eth0/device ->
               ../../../devices/
pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:01.0
```

Excluding the rest of the directory path, check the part corresponding to the file name in the symbolic link destination file of the output results. In the above example, the underlined part shows the bus address. ("0000:0b:01" in the example)
Check the PCI slot number for this bus address.

```
(Example) # grep -il  0000:0b:01  /sys/bus/pci/slots/*/address

/sys/bus/pci/slots/0023_0020/address
```

Read the output file path as shown below, and confirm the PCI slot number.

```
/sys/bus/pci/slots/<BUS number>_<slot number>/address
```

Notes

- <BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes.
- If the above file path is not output, it indicates that the NIC is not mounted in a PCI slot (e.g., GbE port in the GSPB).

With the PCI slot number confirmed here, see D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers to check the mounting location, and see also B.1 Physical Mounting Locations of Components to identify the physical mounting location corresponding the PCI slot number. You can confirm that it matches the mounting location of the operational target NIC.

If the NIC has multiple interfaces, you need to remove all of them. Confirm that all the interfaces that have the same bus address in a subsequent step

```
 (Example) # ls -l /sys/class/net/*/device | grep "0000:0b:01"
lrwxrwxrwx  1 root root 0 Sep 29 09:26 /sys/class/net/eth0/device
 -> ../../../devices/
pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:01.0
lrwxrwxrwx  1 root root 0 Sep 29 09:26 /sys/class/net/eth1/device
 -> ../../../devices/
pci0000:00/0000:00:01.2/0000:08:00.2/0000:0b:01.1
```

As the above example shows, when more than one interface is displayed, they are on the same NIC. If only one interface is displayed, you can skip the rest of this step. Proceed to step 4.
Confirm the hardware address from the interface name managed by the operating system.

```
 (Example) # cat /sys/class/net/eth1/address

00:0e:0c:70:c3:41
```

Confirm the interface name that has this hardware address.

```
 (Example) # grep -il "00:0e:0c:70:c3:41" /etc/sysconfig/network-
scripts/ifcfg-eth*
/etc/sysconfig/network-scripts/ifcfg-eth1
```

The above operations enable you to confirm that the interface existing on the same NIC as eth0 is eth1.

4. Deactivate the NIC.
   Execute the following command to deactivate all the interfaces that you confirmed in step 3.
   The applicable command depends on whether the target interface is a single NIC interface or the SLAVE interface of a bonding device.
   [For a single NIC interface]

```
# /sbin/ifdown ethX
```

If the single NIC interface has a VLAN device, you also need to remove the VLAN interface. Perform the following operations.

```
# /sbin/ifdown ethX.Y
# /sbin/vconfig rem ethX.Y
```

[For the interface under bonding]
Confirm that the SLAVE interface is the interface currently being used for communication.

```
# cat /sys/class/net/bondY/bonding/active_slave
```

If the displayed interface matches the SLAVE interface being replaced, execute the following command to switch the current communication interface to another SLAVE interface.

```
# /sbin/ifenslave -c bondY ethZ
  (ethZ: bondY-configured interface not subject to hot replacement)
```

Finally, remove the SLAVE interface being replaced, from the bonding configuration. Immediately after being removed, the interface is automatically no longer used.

```
# /sbin/ifenslave -d bondY ethX
```

To remove the interfaces, including the bonding device, deactivate them collectively by executing the following command.

```
# /sbin/ifdown bondY
```

5. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 3 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<BUS number>_<slot number>
```

   Note
   <BUS number> and <slot number> are both four-digit decimal values. Here, <BUS number> is information added to the slot number for descriptive purposes. The operational target directory is defined uniquely with <slot number>.

   To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out. The interface (ethX) is removed at the same time.

```
# echo 0 > /sys/bus/pci/slots/<BUS number>_<slot number>/power
```

6. Remove the NIC from the PCI slot.

7. Remove the interface configuration file.

```
# rm /etc/sysconfig/network-scripts/ifcfg-ethX
```

   When deleting a bonding device, also delete the related bonding items.

8. Remove the removed interface configuration from /etc/modprobe.conf.
   Remove the unnecessary associations between interfaces and drivers. When deleting a bonding device, also delete the related bonding items.

```
(Example)
    alias eth1 e1000e
    alias eth2 igb
    alias eth3 igb
    alias eth4 igb
    alias eth5 igb
    alias eth6 igb
    alias eth7 igb
    alias eth8 igb
    alias eth9 igb
    alias eth10 e1000e
    alias eth11 e1000e
    alias scsi_hostadapter mptbase
    alias scsi_hostadapter1 mptscsih
    alias usb-controller ehci-hcd
    alias usb-controller1 uhci-hcd
```

```
    alias scsi_hostadapter2 lpfc
    alias eth0 e1000e   ← Deleted
```

Note

There are no means to dynamically remove the MASTER interface (bondY) of the bonding configuration. If you want to remove the entire bonding interface, you can disable the bonding configuration and remove all the SLAVE interfaces but the MASTER interface itself remains.

However, even if you have a MASTER interface with no SLAVE interface, continue operation as is because there will be no operational problems. The bonding interface will be completely removed at the next system startup.

9. Perform the necessary post-processing.

   If you stopped the ServerView RAID service in step 1,restart the service by using the following procedure.

```
# /sbin/service aurad start
```

Corrective action for the kudzu utility (when removing a NIC card)

The utility (kudzu) for checking for hardware changes may be executed in the system reboot after NIC removal. Take corrective action by using the following procedure.

- In a window displayed by kudzu, select whether to delete the device information for the removed interface from the system. (Confirm the displayed contents.)
- The device information is removed from the system when an interface is removed. The choices are [Remove Configuration], [Keep Configuration], and [Do Nothing]. Select [Keep Configuration].

CHAPTER 6 PCI Card Hot Maintenance in Red Hat Enterprise Linux 6

This chapter describes hot maintenance of PCI cards in Red Hat Enterprise Linux 6.

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6.1 Hot Replacement of PCI Cards

This section describes the following methods of PCI card replacement with the PCI Hot Plug function:

- Common replacement operations for all PCI cards such as power supply operations
- Specific operations added to procedures to use a specified card function or a driver for installation

Remarks

For details on the card replacement procedures not described in this chapter, see the respective product manuals.

6.1.1 Overview of common replacement procedures for all PCI cards

This section provides an overview of common replacement procedures for all PCI cards.

1. Performing the required operating system and software operations depending on the PCI card type
2. Powering off a PCI slot: See Powering on and off PCI slots
3. Replacing a PCI card
4. Powering on a PCI slot: See Powering on and off PCI slots
5. Performing the required operating system and software operations depending on the PCI card type

Note

This chapter provides instructions (e.g., commands, configuration file editing) for the operating system and subsystems. Be sure to refer to the respective product manuals to confirm the command syntax and impact on the system before performing tasks with those instructions.

The following sections describe card addition, removal, and replacement with the required instructions (e.g., commands, configuration file editing) for the operating system and subsystems, together with the actual hardware operations.

6.1.2 PCI card replacement procedure in detail

This section describes how to replace a PCI card.

Preparing the software using a PCI card

When a PCI card is replaced, there must be no software using the PCI card. For this reason, before replacing the PCI card, stop the software using the PCI card or make the software operations inapplicable.

Confirming the slot number of a PCI slot

When replacing a PCI card, you need to manipulate the power supply to the appropriate slot, through the operating system. First, use the following procedure to obtain the slot number from the mounting location of the PCI slot for the card. It will be used to manipulate the power supply.

1. Identify the mounting location of the PCI card to be replaced.
   See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be replaced.

2. Obtain the slot number of the mounting location.
   Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting locations. This slot number is the identification information for operating the slot of the PCI card to be replaced.

Note

The four-digit decimal numbers shown in <Slot number> in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers have the leading digits filled with zeros.

The actual slot numbers do not include the zeros in the leading digits.

Checking the power status of a PCI slot

Using the PCI slot number confirmed in Confirming the slot number of a PCI slot, confirm that the /sys/bus/pci/slots directory contains a directory for this slot information, which will be referenced and otherwise used. Below, the PCI slot number confirmed in Confirming the slot number of a PCI slot is shown at <slot number> location in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<slot number>
```

Confirm that the PCI card in the slot is enabled or disabled by displaying the "power" file contents in this directory.

```
# cat /sys/bus/pci/slots/<slot number>/power
```

When displayed, "0" means disabled, and "1" means enabled.

Powering on and off PCI slots

You can power on and off a PCI slot through an operation on the file confirmed in Checking the power status of a PCI slot.

To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<slot number>/power
```

This operation concurrently removes the device associated with the relevant adapter from the system.

Note

Be sure to manipulate the power supply from the operating system.

To enable the card again and make it available, write "1" to the "power" file in the directory corresponding to the disabled slot.

```
# echo 1 > /sys/bus/pci/slots/<slot number>/power
```

This operation concurrently installs the device associated with the relevant adapter on the system.

Note

After power-on, you need to confirm that the card and driver are correctly installed. The procedures vary depending on the card and driver specifications. For the appropriate procedures, see the respective manuals.

Postprocessing of software using a PCI card

After replacing a PCI card, restart the software stopped before the PCI card replacement or make the software operation applicable again, as needed.

6.1.3 FC card (Fibre Channel card) replacement procedure

The descriptions in this section assume that an FC card is being replaced.
For the PRIMEQUEST 1800E, perform operations from the PSA Web-UI.

Notes

- The FC card used for SAN boot does not support hot plugging.
- This section does not cover configuration changes in peripherals (e.g., UNIT addition or removal for a SAN disk device).
- To prevent a device name mismatch due to the failure, addition, removal, or replacement of an FC card, access the SAN disk unit by using the by-id name (/dev/disk/by-id/...) for the device name.
- If all the paths in a mounted disk become hidden when an FC card is hot replaced, unmount the disk. Then, execute PHP. After PHP has been executed, a device name mismatch may occur.

FC card replacement procedure

The procedure for replacing only a faulty FC card without replacing other peripherals is as follows.

1. Make the necessary preparations.
   Stop access to the faulty FC card, such as by stopping applications.

2. Confirm the slot number of the PCI slot.
   When replacing a PCI card, you need to manipulate the power supply to the appropriate slot, through the operating system. First, use the following procedure to obtain the slot number from the mounting location of the PCI slot for the card. It will be used to manipulate the power supply.
   1. Identify the mounting location of the PCI card to be replaced.
      See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be replaced.
   2. Obtain the slot number of the mounting location.
      Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is the identification information for operating the slot of the PCI card to be replaced.

      Note

      The four-digit decimal numbers shown in <Slot number> in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers have the leading digits filled with zeros. The actual slot numbers do not include the zeros in the leading digits.

3. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 2 is shown at <slot number>location in the directory path in the following format, where the directory is the operational target.

   ```
   /sys/bus/pci/slots/<slot number>
   ```

   To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<slot number>/power
```

This operation concurrently removes the device associated with the relevant adapter from the system.

Note
Be sure to manipulate the power supply from the operating system.

4. Physically replace the target card.

5. Reconfigure the peripheral according to its manual.
   For example, suppose that the storage device used is ETERNUS and that the host affinity function is used (to set the access right for each server). Their settings would need to be changed as a result of FC card replacement.

6. Connect the FC card cable.

7. Power on the PCI slot.
   To enable the card again and make it available, write "1" to the "power" file in the directory corresponding to the disabled slot.

```
# echo 1 > /sys/bus/pci/slots/<slot number>/power
```

This operation concurrently installs the device associated with the relevant adapter on the system.

8. Confirm the incorporation results.
   Confirming the FC card incorporation results describes the confirmation method. Start operation with the FC card again by restarting applications as needed or by other such means.

9. Confirm the incorporation results using Web-UI of PSA.
   For details on the confirmation procedure, see How to confirm the FC card incorporation results (using Web-UI of PSA).

10. Perform the necessary post-processing.
    If you stopped any other application in step 1, restart it too as needed.

Confirming the FC card incorporation results

Confirm the incorporation results of the FC card and the corresponding driver in the following method. Then, take appropriate action.

1. Check the log. (The following example shows a log of FC card hot plugging.)
   As shown below, the output of an FC card incorporation message and device found message as the log output to /var/log/messages after the PCI slot containing the mounted FC card is enabled means that the FC card was successfully incorporated.

```
scsi10:Emulex LPe1250-F8 8Gb PCIe Fibre Channel  \
      Adapter on PCI bus 0f device 08 irq 59  ...(a)
      lpfc 0000:0d:00.0: 0:1303 Link Up Event x1 received  \
      Data: x1 x0 x10 x0 x0 x0 0  ...(b)
      scsi 2:0:0:0: Direct-Access     FUJITSU E4000  \
      0000 PQ: 1 ANSI: 5             ...(c)
```

The \ at the end of a line indicates that there is no line feed.

If only the message in (a) is displayed but the next line is not displayed or if the message in (a) is not displayed, the FC card replacement itself was unsuccessful. (See Note below.) In this case, power off the slot once. Then, check the following points again:

- Whether the FC card is correctly inserted into the PCI slot
- Whether the latch is correctly set

Eliminate the problem, power on the slot again, and check the log.
If the message in (a) is displayed but the FC linkup message in (b) is not displayed, the FC cable may be disconnected or the FC path may not be set correctly. Power off the slot once.
Confirm the following points again.

- Confirm the FC driver setting.
  The definition file containing a description of the driver option of the FC driver (lpfc) is identified with the following command.
  Example: Description in /etc/modprobe.d/lpfc.conf

```
# grep -l lpfc /etc/modprobe.d/*

/etc/modprobe.d/lpfc.conf
```

  Confirm that the driver option of the FC driver (lpfc) is correctly set. For details, contact the distributor where you purchased your product, or your sales representative.

- Check the FC cable connection status.
- Confirm the Storage FC settings.
  Confirm that the settings that conform to the actual connection format (Fabric connection or Arbitrated Loop connection) were made.

Eliminate the problem, power on the slot again, and check the log.

If the messages in (a) and (b) are displayed but the messages in (c) are not displayed, the storage is not yet found. Check the following points again. These are not card problems, so you need not power off the slot for work.

- Review FC-Switch zoning settings.
- Review storage zoning settings.
- Review storage LUN Mapping settings.

Also, confirm that the storage can be correctly viewed from LUN0.

Eliminate the problem. Then, confirm the settings and recognize the system by using the following procedure.

1. Confirm the host number of the incorporated FC card from the message at (a).

xx in scsixx (xx is a numerical value) in the message at (a) is a host number. In the above example, the host number is 10.

2. Scan the device by executing the following command.

```
# echo "-" "-" "-" > /sys/class/scsi_host/hostxx/scan
(# is command prompt)

(xx in hostxx is the host number entered in step 1.)
```

The command for the above example is as follows.

```
# echo "-" "-" "-" > /sys/class/scsi_host/host10/scan
```

3. Confirm that a message like (c) was output to /var/log/messages.
If this message is not displayed, confirm the settings again.

Note
In specific releases of RHEL, a message like (a) for confirming FC card incorporation may be output in the following format with card name information omitted.

```
scsi10 : on PCI bus 0f device 08 irq 59
```

In this case, check for the relevant message on the FC card incorporation by using the following procedure.

1. Confirm the host number.
xx in scsixx (xx is a numerical value) in the message is a host number. In the above example, the host number is 10.

2. Check whether the following file exists by using the host number.

```
/sys/class/scsi_host/hostxx/modeldesc

(xx in hostxx is the host number entered in step 1.)
```

If the file does not exist, the judgment is that no such message was output from the FC card.

3. If the file exists, check the file contents by using the following operation.

```
# cat /sys/class/scsi_host/hostxx/modeldesc
Emulex LPe1250-F8 8Gb PCIe Fibre Channel Adapter

(xx in hostxx is the host number entered in step 1.)
```

If the output is like the above, the judgment is that the relevant message was output by the incorporation of the FC card.

How to confirm the FC card incorporation results (using Web-UI of PSA)

1. From the Web-UI of PSA, display the Fibre Channel window.
   For details on how to display the Web-UI, see Chapter 3 PSA Web-UI (Web user interface) Operations in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).
2. Confirm that all the information of the disk incorporated in the FC card is displayed in [Information about devices connected to controller] and that n.a. or - (hyphen) is not displayed for any item in the disk information.
3. If any item is not properly displayed (FIGURE 6.1 [Fibre Channel] window (example)), restart PSA or execute the following PSA command manually.

```
/opt/FJSVpsa/sh/force_search.sh –a
```

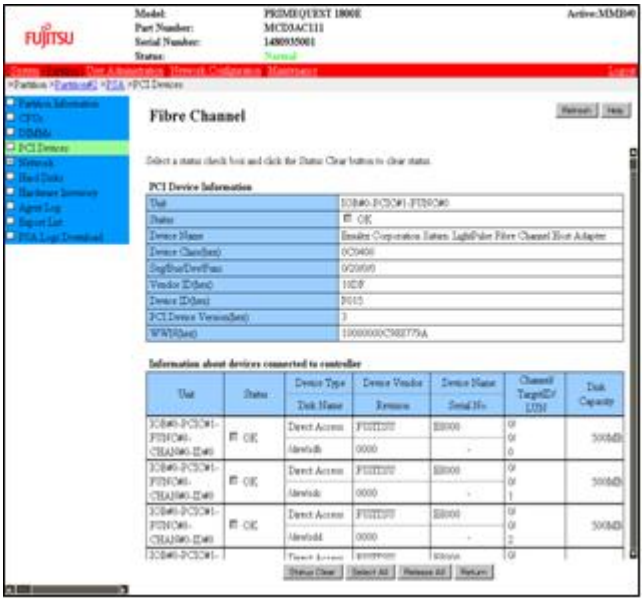

FIGURE 6.1 [Fibre Channel] window (example)

4. Click the [Refresh] button to update the window, and confirm that the information is displayed correctly.
   It takes up to three minutes to update the window.

6.1.4 Network card replacement procedure

Network card (referred to below as NIC) replacement using hot plugging needs specific processing before and after PCI slot power-on or power-off. Its procedure also includes to the common PCI card replacement procedure.
The procedure describes operations where a single NIC is configured as one interface. It also describes cases where multiple NICs are bonded together to configure one interface (bonding configuration).

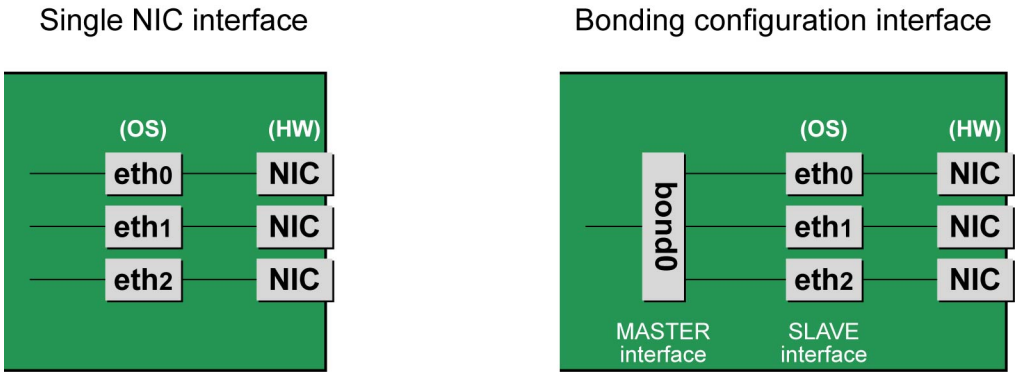

FIGURE 6.2 Single NIC interface and bonding configuration interface

NIC replacement procedure

This section describes the procedure for NIC replacement.

Notes

- When replacing multiple NICs, be sure to replace them one by one. If you replace multiple cards at the same time, they may not be correctly configured.
- To perform hot replacement in a system where a bonding device is installed, design the system so that it specifies ONBOOT=YES in all interface configuration files (the /etc/sysconfig/network-scripts/ifcfg-eth*files and the /etc/sysconfig/network-scripts/ifcfg-bond*files), regardless of whether the NIC to be replaced is a configuration interface of the bonding device.
  An IP address does not need to be assigned to unused interfaces. This procedure is for preventing the device name of the replacement target NIC from being changed after hot replacement. If ONBOOT=NO also exists, the procedure described here may not work properly.

1. Confirm the slot number of the PCI slot that has the mounted interface.
   Confirm the interface mounting location through the configuration file information and the operating system information.
   First, confirm the bus address of the PCI slot that has the mounted interface to be replaced
   Example: eth0 interface

```
# ls -l /sys/class/net/eth0/device
lrwxrwxrwx 1 root root 0 Sep 29 10:17 \
/sys/class/net/eth0/device
->../../../0000:00:01.2/0000:08:00.2/0000:0b:01.0
```

   The \ at the end of a line indicates that there is no line feed.

   Excluding the rest of the directory path, check the part corresponding to the file name in the symbolic link destination file of the output results. In the above example, the underlined part shows the bus address.
   ("0000:0b:01" in the example)

   Note
   You will use the bus address obtained here in steps 2 and 11. Record the bus address so that you can reference it later.

Next, check the PCI slot number for this bus address.

```
# grep -il 0000:0b:01 /sys/bus/pci/slots/*/address

/sys/bus/pci/slots/20/address
```

Read the output file path as shown below, and confirm the PCI slot number.

```
/sys/bus/pci/slots/<slot number>/address
```

Notes

If the above file path is not output, it indicates that the NIC is not mounted in a PCI slot (e.g., GbE port in the GSPB).

With the PCI slot number confirmed here, see D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers to check the mounting location, and see also B.1 Physical Mounting Locations of Components to identify the physical mounting location corresponding to the PCI slot number. You can confirm that it matches the mounting location of the operational target NIC.

2. Collect information about interfaces on the same NIC.
   For a NIC that has more than one interface, you will need to deactivate all the interfaces on the NIC. Use the following procedure to check each interface that has the same bus address as that confirmed in step 1. Then, make a table with information including the interface name, hardware address, and bus address.

   Note

   Collect the following information even if the NIC has only one interface.

   1. Confirm the correspondence between the bus address and interface name.
      Execute the following command, and confirm the correspondence between the bus address and interface name.
      Example: The bus address is "0000:0b:01".

      ```
      # ls -l /sys/class/net/*/device | grep "0000:0b:01"
      lrwxrwxrwx 1 root root 0 Sep 29 10:17 \
      /sys/class/net/eth0/device
      ->../../../0000:00:01.2/0000:08:00.2/0000:0b:01.0
      lrwxrwxrwx 1 root root 0 Sep 29 10:17 \
      /sys/class/net/eth1/device
      ->../../../0000:00:01.2/0000:08:00.2/0000:0b:01.1
      ```

      The \ at the end of a line indicates that there is no line feed.

      The following table shows the correspondence between the bus addresses and interface names from the above output example.

TABLE 6.1 Correspondence between bus addresses and interface names

Interface name	Hardware address	Bus address	Slot number
eth0		0000:0b:01.0	20
eth1		0000:0b:01.1	20
...		...	...

Note
When recording a bus address, include the function number (number after the period).

2. Confirm the correspondence between the interface name and hardware address.
   Execute the following command, and confirm the correspondence between the interface name and hardware address.
   Example: eth0
   [For a single interface]

```
# cat /sys/class/net/eth0/address

00:0e:0c:70:c3:38
```

   [For a bonding interface]
   The bonding driver rewrites the values for the slave interface of the bonding device.
   Confirm the hardware address by executing the following command.

```
# cat /proc/net/bonding/bondY

Ethernet Channel Bonding Driver .........
.
.
Slave interface: eth0
.
Permanent HW addr: 00:0e:0c:70:c3:38
.
.
```

   You can use this procedure only when the bonding device is active. If the bonding device is not active or the slave has not been incorporated, use the same procedure as for a single interface.

   Also, the correspondence between the interface name and hardware address is automatically registered by the system in the udev function rule file, /etc/udev/rules.d/70-persistent-net.rules. Confirm that the ATTR{address} and NAME items have the same definitions as in the above output.
   Example: eth0

```
# grep eth0 /etc/udev/rules.d/70-persistent-net.rules

SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:38", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth0"
```

The \ at the end of a line indicates that there is no line feed.

You can always obtain the correct hardware address from the description in etc/udev/rules.d/70-persistent-net.rules regardless of whether the interface is incorporated in bonding.

Confirm the hardware address of other interfaces by repeating the operation with the same command. The following table lists examples of descriptions.

TABLE 6.2 Hardware address description examples

Interface name	Hardware address	Bus address	Slot number
eth0	00:0e:0c:70:c3:38	0000:0b:01.0	20
eth1	00:0e:0c:70:c3:39	0000:0b:01.1	20
...	...	...	...

The above step is used in creating the correspondence table in step 13. Prepare a table here so that you can reference it later.

Note
In a replacement due to a device failure, the information in the table showing the correspondence between the interface and the hardware address, bus address, and slot number may be inaccessible depending on the failure condition. We strongly recommend that a table showing the correspondence between the interface and the hardware address, bus address, and slot number be created for all interfaces at system installation.

3. Execute the higher-level application processing required before NIC replacement.
   Stop all access to the interface as follows. Stop the application that was confirmed in step 2 as using the interface, or exclude the interface from the target of use by the application.

4. Deactivate the NIC.
   Execute the following command to deactivate all the interfaces that you confirmed in step 2.
   The applicable command depends on whether the target interface is a single NIC interface or the SLAVE interface of a bonding device.
   [For a single NIC interface]

```
# /sbin/ifdown ethX
```

   If the single NIC interface has a VLAN device, you also need to remove the VLAN interface. Perform the following operations (before deactivating the real interface).

```
# /sbin/ifdown ethX.Y
# /sbin/vconfig rem ethX.Y
```

[For the SLAVE interface of a bonding device]
If the bonding device is operating in mode 1, use the following steps for safety purposes on the SLAVE interface to be replaced to exclude it from operation. In any other mode, removing it immediately should not cause any problems.
Confirm that the SLAVE interface to be replaced is the interface currently being used for communication. First, confirm the interface currently being used for communication by executing the following command.

```
# cat /sys/class/net/bondY/bonding/active_slave
```

If the displayed interface matches the SLAVE interface being replaced, execute the following command to switch the current communication interface to another SLAVE interface.

```
# /sbin/ifenslave -c bondY ethZ
```

(ethZ: Interface that composes bondY and does not perform hot replacement)

Finally, remove the SLAVE interface being replaced, from the bonding configuration.
Immediately after being removed, the interface is automatically no longer used.

```
# /sbin/ifenslave -d bondY ethX
```

5. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 1 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<slot number>
```

   To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out. The interface (ethX) is removed at the same time.

```
# echo 0 > /sys/bus/pci/slots/<slot number>/power
```

6. Save the interface configuration file.
   Save all the interface configuration files that you checked in step 2 by executing the following command.
   udevd and configuration scripts may reference the contents of files in /etc/sysconfig/network-scripts. For this reason, create a save directory and save these files to the directory so that udevd and the configuration scripts will not reference them.

```
# cd /etc/sysconfig/network-scripts
# mkdir temp
# mv ifcfg-ethX temp
(following also executed for bonding configuration)
# mv ifcfg-bondX temp
```

7. Replace the NIC.

8. Delete the entries associated with the replaced NIC from the udev function rule file.
   Each entry for the new NIC is automatically added to the udev function rule file, /etc/udev/rules.d/70-persistent-net.rules, when the NIC is detected. However, the entries of a NIC are not automatically deleted even if the NIC is removed. Leaving the entries of the removed NIC may have the following impact.
   - The interface names defined in the entries of the removed NIC cannot be assigned to the replacement NIC or an added NIC.

   For this reason, delete or comment out the entries of the removed NIC from the udev function rule file.

   1. Confirm the correspondence between the interface name and hardware address in the table created in step 2.
   2. Edit the udev function rule file, /etc/udev/rules.d/70-persistent-net.rules, to delete or comment out the entry lines of all the interface names and hardware addresses confirmed in the above step 1.

   The following example shows editing of the udev function rule file.
   [Example of descriptions in the file before editing]

```
# PCI device 0x****:0x**** (e1000)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:38", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth0"

# PCI device 0x****:0x**** (e1000)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:39", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth1"
:
:
```

   The \ at the end of a line indicates that there is no line feed.

   [Example of descriptions in the file after editing] (In the example, eth0 was deleted, and eth1 is commented out.)

```
# PCI device 0x****:0x**** (e1000)
# SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
```

```
ATTR{address}=="00:0e:0c:70:c3:39", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth1"
:
:
```

The \ at the end of a line indicates that there is no line feed.

Do this editing for all the interfaces listed in the table created in step 2.

9. Reflect the edited rules in udev.
   udevd reads the rules described in the rule file at its start time and then retains the rules in memory. Simply changing the rule file does not mean the changed rules are reflected.
   Take action as follows to reflect the new rules in udev.

```
# udevadm control --reload-rules
```

10. Power on the PCI slot.
    To enable the card again and make it available, write "1" to the "power" file in the directory corresponding to the disabled slot.

```
# echo 1 > /sys/bus/pci/slots/<slot number>/power
```

    This also installs the device associated with the relevant adapter on the system.

11. Collect the information associated with an interface on the replacement NIC.
    An interface (ethX) is created for the replacement NIC at the power-on time. Make a table with information about each interface created for the replacement NIC. Such information includes the interface name, hardware address, and bus address. Use the bus address confirmed in step 1 and the same procedure as in step 2.

TABLE 6.3 Example of interface information about the replacement NIC

Interface name	Hardware address	Bus address	Slot number
eth1	00:0e:0c:70:c3:40	0000:0b:01.0	20
eth0	00:0e:0c:70:c3:41	0000:0b:01.1	20
...	...	...	...

Confirm that a new hardware address is defined for the bus address. Also confirm that the assigned interface name is the same as that before the NIC replacement.
Also confirm that the relevant entries in the above-described table were automatically added to the udev function rule file, /etc/edev/rules.d/70-persistent-net.rules.

Note

The correspondence between the bus address and interface name may be different from that before NIC replacement. In such cases, just proceed with the work. This is explained in step 13.

12. Deactivate each newly created interface.
    The interfaces created for the replacement NIC may be active because power is on to the PCI slot. In such cases, you need to deactivate them before changing the interface configuration file.
    Execute the following command for all the interface names confirmed in step 11.
    Example: eth0

```
# /sbin/ifconfig eth0 down
```

13. Confirm the correspondence between the interface names before and after the NIC replacement.
    From the interface information created before and after the NIC replacement in steps 2 and 11, confirm the correspondence between the interface names before replacement and the new interface names.

    1. Confirm the correspondence between the bus address and interface name on each line in the table created in step 2.

    2. Likewise, confirm the correspondence between the bus addresses and interface names in the table created in step 11.

    3. Match the interface names to the same bus addresses before and after the NIC replacement.

    4. In the table created in step 11, enter values corresponding to the interface names before and after the NIC replacement.

    TABLE 6.4 Example of entered values corresponding to the interface names before and after NIC replacement

Interface name After replacement (-> Before replacement)	Hardware address	Bus address	Slot number
eth1 (-> eth0)	00:0e:0c:70:c3:40	0000:0b:01.0	20
eth0 (-> eth1)	00:0e:0c:70:c3:41	0000:0b:01.1	20
...	...	...	...

14. If an interface name is switched before and after the NIC replacement, make the interface name correspond to the same bus address as before the NIC replacement by using the following procedure.

    Note
    Confirm that the interface name is the same before and after the NIC replacement.
    Then, proceed to step 15.

    1. Power off the PCI slot again.

Repeat the process done in step 5 to power off the PCI slot.

```
# echo 0 > /sys/bus/pci/slots/<slot-number>/power
```

2. Correct the interface name that is not the same before and after the NIC replacement in the entries of the udev function rule file, /etc/edev/rules.d/70-persistent-net.rules.
   Make the interface name the same as before the NIC replacement.

   [Example of descriptions in the file before editing]

```
# PCI device 0x****:0x**** (e1000)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:40", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth1"

# PCI device 0x****:0x**** (e1000)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:41", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth0"
:
:
```

   The \ at the end of a line indicates that there is no line feed.

   [Example of descriptions in the file after editing] (eth1, the name after replacement, has been corrected to eth0, the name before replacement.)

```
# PCI device 0x****:0x**** (e1000)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:40", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth0"
# PCI device 0x****:0x**** (e1000)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:41", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth1"
:
:
```

   The \ at the end of a line indicates that there is no line feed.

3. Reflect the edited rules again.
   Repeat the process done in step 9 to reflect the rules.

```
# udevadm control --reload-rules
```

4. Power on the PCI slot.
   Repeat the process done in step 10 to power on the PCI slot.

   ```
   # echo 1 > /sys/bus/pci/slots/<slot-number>/power
   ```

   The interfaces created for the replacement NIC may be active because power is on to the PCI slot. At this stage, since we recommend proceeding with the work with the interface on the replaced NIC deactivated, repeat the operation in step 12.

5. Collect the information about interfaces on the NIC again, and create a table.
   Use the same procedure as in step 2 to update the interface name information in the table from step 13 showing the correspondence of the interface before and after NIC replacement.

   Note
   Confirm that each specified interface name is the same as before the NIC replacement.

   TABLE 6.5 Confirmation of interface names

Interface name	Hardware address	Bus address	Slot number
eth0	00:0e:0c:70:c3:40	0000:0b:01.0	20
eth1	00:0e:0c:70:c3:41	0000:0b:01.1	20
...	...	...	...

15. Edit the saved interface configuration file.
    Write a new hardware address to replace the old one. In "HWADDR," set the hardware address of the replacement NIC in TABLE 6.4 Example of entered values corresponding to the interface names before and after NIC replacement or TABLE 6.5 Confirmation of interface names. Also, for SLAVE under bonding, the file contents are partly different, but the lines to be set are the same.

    ```
    (Example)
    DEVICE=eth0
    NM_CONTROLLED=no
    BOOTPROTO=static
    HWADDR=00:0E:0C:70:C3:40
    BROADCAST=192.168.16.255
    IPADDR=192.168.16.1
    NETMASK=255.255.255.0
    NETWORK=192.168.16.0
    ONBOOT=yes
    TYPE=Ethernet
    ```

    Do this editing for all the saved interfaces.

16. Restore the saved interface configuration file to the original file.
    Restore the interface configuration file saved to the save directory to the original file by executing the following command.

```
# cd /etc/sysconfig/network-scripts/temp
# mv ifcfg-ethX ..
(following also executed for bonding configuration)
# mv ifcfg-bondX ..
```

17. Activate the replaced interface.
    The method for activating a single NIC interface differs from that for activating the SLAVE interfaces under bonding.

    [For a single NIC interface]
    Execute the following command to activate the interface. Activate all the necessary interfaces.

```
# /sbin/ifup ethX
```

    Also, if the single NIC interface has a VLAN device and the VLAN interface was temporarily removed, restore the VLAN interface. If the priority option has changed, set it again.

```
# /sbin/vconfig add ethX Y
# /sbin/ifup ethX.Y
(enter command to set VLAN option as needed)
```

    [For SLAVE under bonding]
    Execute the following command to incorporate the SLAVE interface into the existing bonding configuration. Incorporate all the necessary interfaces.

```
# /sbin/ifenslave bondY ethX
```

    The VLAN-related operation is normally not required because a VLAN is created on the bonding device.

18. Remove the directory to which the interface configuration file was saved.
    After all the interfaces to be replaced have been replaced, remove the save directory created in step 6 by executing the following command.

```
# rmdir /etc/sysconfig/network-scripts/temp
```

19. Execute the higher-level application processing required after NIC replacement.
    Perform the necessary post processing (such as starting an application or restoring changed settings) for the operations performed for the higher-level applications in step 3.

6.1.5 Hot replacement procedure for iSCSI (NIC)

When performing hot replacement of NICs used for iSCSI connection, use the following procedures.
6.1.1 Overview of common replacement procedures for all PCI cards

6.1.2 PCI card replacement procedure in detail

6.1.4 Network card replacement procedure

A supplementary explanation of the procedure follows.

Prerequisites for iSCSI (NIC) hot replacement

The prerequisites for iSCSI (NIC) hot replacement are as follows.

- The storage connection is established on a multipath using DM-MP (Device-Mapper Multipath) or ETERNUS multidriver (EMPD).
- To replace more than one iSCSI card, one card at a time will be replaced.
- A single NIC is configured as one interface.

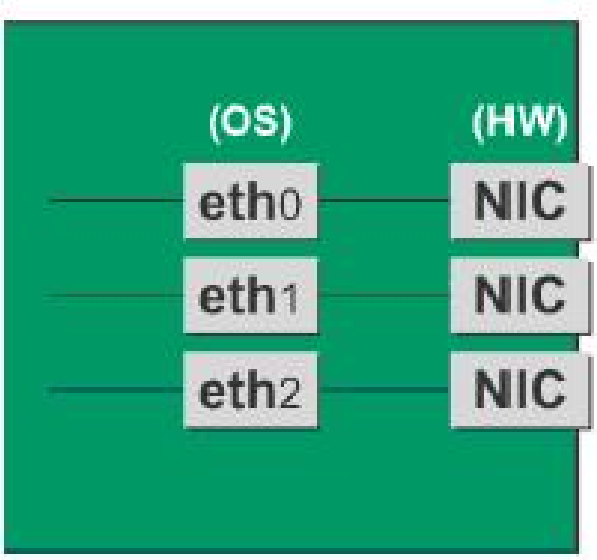

FIGURE 6.3 Example of single NIC interface

Work to be performed before NIC replacement

For iSCSI (NIC) hot replacement, be sure to follow the procedure below when performing Step 3 of the NIC replacement procedure in 6.1.4 Network card replacement procedure.

1. Perform the work for suppressing access to the iSCSI connection interface.
    1. Use the iscsiadm command to log out from the path (iqn) through which the iSCSI card to be replaced is routed, and disconnect the session.
    2. Use the iscsiadm command to confirm that the target session has been disconnected. You can confirm the disconnection of sessions on multipath products using DM-MP (*1) or ETERNUS multidriver (*2).
    *1: Write down the DM-MP display contents at the session disconnection.
    *2: See the ETERNUS Multipath Driver User's Guide (For Linux).

Work to be performed after NIC replacement

For iSCSI (NIC) hot replacement, be sure to follow the procedure below when Step 19 of the NIC replacement procedure in 6.1.4 Network card replacement procedure.

1. To restore access to the iSCSI connection interface, perform the following.
    1. Use the iscsiadm command to log in to the path (iqn) through which the replacement iSCSI card is routed, and reconnect the session.
    2. Use the iscsiadm command to confirm that the target session has been activated.
    3. You can confirm the activation of sessions on multipath products using DM-MP (*1) or ETERNUS multidriver (*2).

*1: Write down the DM-MP display contents at the session activation.

*2: See the ETERNUS Multipath Driver User's Guide (For Linux).

6.2 Hot Addition of PCI Cards

This section describes the PCI card addition procedure with the PCI Hot Plug function.
The procedure includes common steps for all PCI cards and the additional steps required for a specific card function or driver.
Thus, the descriptions cover both the common operations required for all cards (e.g., power supply operations) and the specific procedures required for certain types of card. For details on addition of the cards not described in this section, see the respective product manuals.

6.2.1 Common addition procedures for all PCI cards

1. Performing the required operating system and software operations depending on the PCI card type
2. Confirming that the PCI slot power is off: See Powering on and off PCI slots.
3. Adding a PCI card
4. Powering on a PCI slot: See Powering on and off PCI slots.
5. Performing the required operating system and software operations depending on the PCI card type

Notes
This section describes instructions for the operating system and subsystems (e.g., commands, configuration file editing). Be sure to refer to the respective product manuals to confirm the command syntax and impact on the system before performing tasks with those instructions.

The following sections describe card addition with the required instructions (e.g., commands, configuration file editing) for the operating system and subsystems, together with the actual hardware operations.

6.2.2 PCI card addition procedure in detail

This section describes operations that must be performed in the PCI card addition procedure.

Confirming the slot number of a PCI slot

When adding a PCI card, you need to manipulate the power supply to the appropriate slot, through the operating system. First, use the following procedure to obtain the BUS number and slot number from the physical location of the PCI slot for the card. It will be used to manipulate the power supply.

1. Identify the mounting location of the PCI card to be added.
   See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be added.

2. Obtain the slot number of the mounting location.
   Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be added.

   Note
   The four-digit decimal numbers shown in <Slot number> in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers have the leading digits filled with zeros. The actual slot numbers do not include the zeros in the leading digits.

Checking the power status of a PCI slot

Using the PCI slot number confirmed in Confirming the slot number of a PCI slot, confirm that the /sys/bus/pci/slots directory contains a directory for this slot information, which will be referenced and otherwise used. Below, the PCI slot number confirmed in Confirming the slot number of a PCI slot is shown at <slot number> location in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<slot number>
```

Confirm that the PCI card in the slot is enabled or disabled by displaying the "power" file contents in this directory.

```
# cat/sys/bus/pci/slots/<slot number>/power
```

When displayed, "0" means disabled, and "1" means enabled.

Powering on and off PCI slots

You can power on and off a PCI slot through an operation on the file confirmed in Checking the power status of a PCI slot. To disable a slot and make it ready for the addition of a PCI card, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<slot number>/power
```

Note

Be sure to manipulate the power supply from the operating system.

After the PCI card is added to the target slot, to enable the target slot and make it ready for use, write "1" to the "power" file in the directory corresponding to the target slot.

```
# echo 1 > /sys/bus/pci/slots/<slot number>/power
```

This also installs the device associated with the relevant adapter on the system.

Note

After power-on, you need to confirm that the card and driver are correctly installed. The procedures vary depending on the card and driver specifications. For the appropriate procedures, see the respective manuals.

6.2.3 FC card (Fibre Channel card) addition procedure

The descriptions in this section assume that an FC card is being added.
For the PRIMEQUEST 1800E, perform operations from the PSA Web-UI.

Notes

- The FC card used for SAN boot does not support hot plugging.
- This section does not cover configuration changes in peripherals (e.g., UNIT addition or removal for a SAN disk device).
- To prevent a device name mismatch due to the failure, addition, removal, or replacement of an FC card, access the SAN disk unit by using the by-id name (/dev/disk/by-id/...) of the device name.

FC card addition procedure

The procedure for adding new FC cards and peripherals is as follows.

1. Confirm the slot number of the PCI slot by using the following procedure.
    1. Identify the mounting location of the PCI card to be added.
       See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be added.

    2. Obtain the slot number of the mounting location.
       Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be added.

       Note
       The four-digit decimal numbers shown in <Slot number> in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers have the leading digits filled with zeros. The actual slot numbers do not include the zeros in the leading digits.

2. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 1 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

   ```
   /sys/bus/pci/slots/<slot number>
   ```

   To disable a slot and make it ready for the addition of a PCI card, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

   ```
   # echo 0 > /sys/bus/pci/slots/<slot number>/power
   ```

   Note
   Be sure to manipulate the power supply from the operating system.

3. Physically add the target card.

4. Reconfigure the peripheral according to its manual.
   For example, suppose that the storage device used is ETERNUS and that the host affinity function is used (to set the access right for each server). Their settings would need to be changed as a result of FC card replacement.

5. Connect the FC card cable.

6. Power on the PCI slot.
   To enable the target slot and make it ready for use, write "1" to the "power" file in the directory corresponding to the slot of the added PCI card.

   ```
   # echo 1 >/sys/bus/pci/slots/<slot number>/power
   ```

This also installs the device associated with the relevant adapter on the system.

7. Confirm the incorporation results.
   The contents of this confirmation method are the same as those of the confirmation method in the FC card replacement procedure. See Confirming the FC card incorporation results.

8. Confirm the incorporation results using Web-UI of PSA.
   The confirmation procedure is the same as the procedure performed for the replacement of the FC card. See How to confirm the FC card incorporation results (using Web-UI of PSA).

6.2.4 Network card addition procedure

NIC (network card) addition using hot plugging needs specific processing before and after PCI slot power-on or power-off. Its procedure also includes the common PCI card addition procedure.
The procedure describes operations where a single NIC is configured as one interface. It also describes cases where multiple NICs are bonded together to configure one interface (bonding configuration).

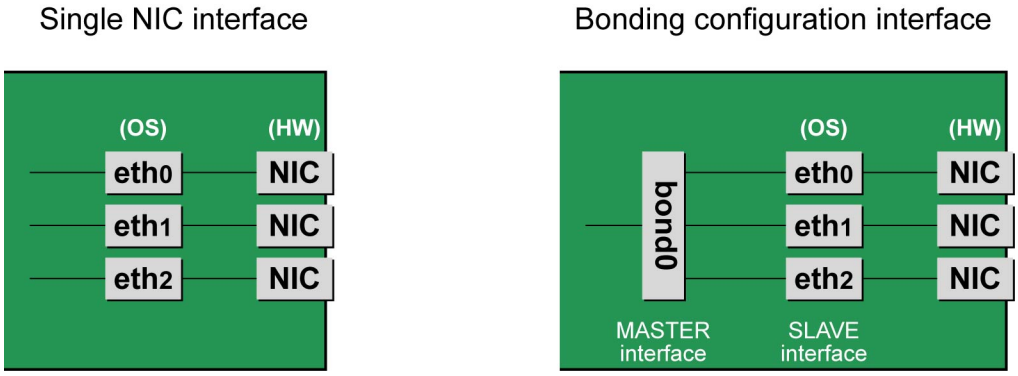

FIGURE 6.4 Single NIC interface and bonding configuration interface

NIC addition procedure

This section describes the procedure for hot plugging only a network card.

Note

When adding multiple NICs, be sure to add them one by one. If you do this with multiple cards at the same time, the correct settings may not be made.

1. Confirm the existing interface names.
   To confirm the interface names, execute the following command.
   Example: eth0 is the only interface on the NIC.

```
# /sbin/ifconfig -a

eth0      Link encap:Ethernet HWaddr 00:0E:0C:70:C3:38
          BROADCAST MULTICAST MTU:1500 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RXbytes:0 (0.0 b) TX bytes:0 (0.0 b)
```

```
lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RXbytes:0 (0.0 b) TX bytes:0 (0.0 b)
```

2. Confirm the slot number of the PCI slot containing an interface by using the following procedure.
    1. Identify the mounting location of the PCI card to be added.
       See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be added.

    2. Obtain the slot number of the mounting location.
       Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be added.

       Note
       The four-digit decimal numbers shown in <Slot number> in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers have the leading digits filled with zeros. The actual slot numbers do not include the zeros in the leading digits.

3. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 2 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<slot number>
```

   To disable a slot and make it ready for the addition of a PCI card, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<slot number>/power
```

   Note
   Be sure to manipulate the power supply from the operating system.

4. Add the NIC to the PCI slot.

5. Power on the PCI slot.
   To enable a PCI card and make it ready for use, write "1" to the "power" file in the directory corresponding to the slot to which the PCI card is added. The interface (ethX) is added at the same time.

```
# echo 1 > /sys/bus/pci/slots/<slot number>/power
```

6. Confirm the newly added interface name.
   Powering on the slot creates an interface (ethX) for the added NIC. Execute the following command. Compare its results with those of step 2 to confirm the created interface name.

```
# /sbin/ifconfig -a
```

7. Confirm the hardware address of the newly added interface.
   Confirm the hardware address (HWaddr) and the created interface by executing the ifconfig command. For a single NIC with multiple interfaces, confirm the hardware addresses of all the created interfaces.
   Example: eth1 is a new interface created for the added NIC.

```
# /sbin/ifconfig -a

eth0      Link encap:Ethernet HWaddr 00:0E:0C:70:C3:38
          BROADCAST MULTICAST MTU:1500 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RXbytes:0 (0.0 b) TX bytes:0 (0.0 b)

eth1      Link encap:Ethernet HWaddr 00:0E:0C:70:C3:40
          BROADCAST MULTICAST MTU:1500 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RXbytes:0 (0.0 b) TX bytes:0 (0.0 b)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RXbytes:0 (0.0 b) TX bytes:0 (0.0 b)
```

8. Create an interface configuration file.
   Create an interface configuration file (/etc/sysconfig/network-scripts/ifcfg-ethX) for the newly created interface as follows. In "HWADDR," set the hardware address confirmed in step 7.
   If multiple NICs are added or if a NIC where multiple interfaces exist is added, create a file for all the interfaces.

   The explanation here assumes, as an example, that a name automatically assigned by the system is used.

To install a new interface, you can use a new interface name different from the one automatically assigned by the system. Normally, there is no requirement on the name specified for a new interface.
To use an interface name other than the one automatically assigned by the system, follow the instructions in step 14 of the NIC replacement procedure.

The contents differ slightly depending on whether the interface is a single NIC interface or a SLAVE interface of the bonding configuration.
[For a single NIC interface]

```
(Example)
DEVICE=eth1 ←Specified interface name confirmed in step 7
NM_CONTROLLED=no
BOOTPROTO=static
HWADDR=00:0E:0C:70:C3:40
BROADCAST=192.168.16.255
IPADDR=192.168.16.1
NETMASK=255.255.255.0
NETWORK=192.168.16.0
ONBOOT=yes
TYPE=Ethernet
```

[SLAVE interface of the bonding configuration]

```
(Example)
DEVICE=eth1 ←Specified interface name confirmed in step 7
NM_CONTROLLED=no
BOOTPROTO=static
HWADDR=00:0E:0C:70:C3:40
MASTER=bondY
SLAVE=yes
ONBOOT=yes
```

Note
Adding the bonding interface itself also requires the MASTER interface configuration file of the bonding configuration.

9. To add a bonding interface, configure the bonding interface driver settings.
   If the bonding interface has already been installed, execute the following command to check the descriptions in the configuration file and confirm the setting corresponding to the bonding interface and driver.
   Example: Description in /etc/modprobe.d/bonding.conf

```
# grep -l bonding /etc/modprobe.d/*

/etc/modprobe.d/bonding.conf
```

Note

If the configuration file is not found or if you are performing an initial installation of the bonding interface, create a configuration file with an arbitrary file name with the ".conf" extension (e.g., /etc/modprobe.d/bonding.conf) in the /etc/modprobe.d directory.

After specifying the target configuration file, add the setting for the newly created bonding interface.

```
alias bondY bonding <- Add
```

bondY: Name of the newly added bonding interface

You can specify options of the bonding driver in this file. Normally, the BONDING_OPTS line in each ifcfg-bondY file is used.

Options can be specified to the bonding driver.

10. Activate the added interface.

    Execute the following command to activate the interface. Activate all the necessary interfaces. The activation method depends on the configuration.

    [For a single NIC interface]

    Execute the following command to activate the interface. Activate all the necessary interfaces.

    ```
    # /sbin/ifup ethX
    ```

    [For the bonding configuration]

    For a SLAVE interface added to an existing bonding configuration, execute the following command to incorporate it into the bonding configuration.

    Example: bondY is the bonding interface name, and ethX is the name of the interface to be incorporated.

    ```
    # /sbin/ifenslave bondY ethX
    ```

    For a newly added bonding interface with a SLAVE interface, execute the following command to activate the interfaces. You need not execute the ifenslave command individually for the SLAVE interface.

    ```
    # /sbin/ifup bondY
    ```

6.3 Removing PCI Cards

This section describes the PCI card removal procedure with the PCI Hot Plug function.
The procedure includes common steps for all PCI cards and the additional steps required for a specific card function or driver.
Thus, the descriptions cover both the common operations required for all cards (e.g., power supply operations) and the specific procedures required for certain types of card. For details on removal of the cards not described in this section, see the respective product manuals.

6.3.1 Common removal procedures for all PCI cards

1. Performing the required operating system and software operations depending on the PCI card type
2. Confirming that the PCI slot power is off: See Powering off a PCI slot
3. Removing a PCI card
4. Performing the required operating system and software operations depending on the PCI card type

Note
This section describes instructions for the operating system and subsystems (e.g., commands, configuration file editing). Be sure to refer to the respective product manuals to confirm the command syntax and impact on the system before performing tasks with those instructions.

The following sections describe card removal with the required instructions (e.g., commands, configuration file editing) for the operating system and subsystems, together with the actual hardware operations.

6.3.2 PCI card removal procedure in detail

This section describes operations that must be performed in the PCI card removal procedure.

Preparing the software using a PCI card

When a PCI card is removed, there must be no software using the PCI card. For this reason, before removing the PCI card, stop the software using the PCI card or make the software operations inapplicable.

Confirming the slot number of a PCI slot

When removing a PCI card, you need to manipulate the power supply to the appropriate slot, through the operating system. First, use the following procedure to obtain the BUS number and slot number from the physical location of the PCI slot for the card. It will be used to manipulate the power supply.

1. Identify the mounting location of the PCI card to be removed.
   See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be removed.

2. Obtain the slot number of the mounting location.
   Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be removed.

   Note

The four-digit decimal numbers shown in <Slot number> in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers have the leading digits filled with zeros.
The actual slot numbers do not include the zeros in the leading digits.

Checking the power status of a PCI slot

Using the PCI slot number confirmed in Confirming the slot number of a PCI slot, confirm that the /sys/bus/pci/slots directory contains a directory for this slot information, which will be referenced and otherwise used. Below, the slot number is shown at <slot number> location in the directory path in the following format, where the directory is the operational target.

```
/sys/bus/pci/slots/<slot number>
```

Confirm that the PCI card in the slot is enabled or disabled by displaying the "power" file contents in this directory

```
# cat/sys/bus/pci/slots/<slot number>/power
```

When displayed, "0" means disabled, and "1" means enabled.

Powering off a PCI slot

You can power off a PCI slot through an operation on the file confirmed in Checking the power status of a PCI slot.
To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

```
# echo 0 > /sys/bus/pci/slots/<slot number>/power
```

This concurrently removes the device associated with the relevant adapter from the system.

Note
Be sure to manipulate the power supply from the operating system.

6.3.3 FC card (Fibre Channel card) removal procedure

The descriptions in this section assume that an FC card is being removed.

Notes

- The FC card used for SAN boot does not support hot plugging.
- This section does not cover configuration changes in peripherals (e.g., UNIT addition or removal for a SAN disk device).
- To prevent a device name mismatch due to the failure, addition, removal, or replacement of an FC card, access the SAN disk unit by using the by-id name (/dev/disk/by-id/...) for the device name.

FC card removal procedure

The procedure for removing an FC card and peripherals is as follows.

1. Make the necessary preparations.
   Stop access to the FC card by stopping applications or by other such means.

2. Confirm the slot number of the PCI slot by using the following procedure.

    1. Identify the mounting location of the PCI card to be removed.
    See the figure in B.1 Physical Mounting Locations of Components to check the mounting location (board and slot) of the PCI card to be removed.

    2. Obtain the slot number of the mounting location.
    Check the table in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers, and obtain the slot number that is unique in the cabinet and assigned to the confirmed mounting location. This slot number is identification information for operating the slot of the PCI card to be removed.

    Note
    The four-digit decimal numbers shown in <Slot number> in D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers have the leading digits filled with zeros. The actual slot numbers do not include the zeros in the leading digits.

3. Power off the PCI slot.
    Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 2 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

    ```
    /sys/bus/pci/slots/<slot number>
    ```

    To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out.

    ```
    # echo 0 > /sys/bus/pci/slots/<slot number>/power
    ```

    This concurrently removes the device associated with the relevant adapter from the system.

    Note
    Be sure to manipulate the power supply from the operating system.

4. Physically remove the target card.

5. Perform the necessary post-processing.
    If you stopped any other application in step 1, restart it too as needed.

6.3.4 Network card removal procedure

Network card (referred to below as NIC) removal using hot plugging needs specific processing before and after PCI slot power-on or power-off. Its procedure also includes the common PCI card removal procedure.
The procedure describes operations where a single NIC is configured as one interface. It also describes cases where multiple NICs are bonded together to configure one interface (bonding configuration).

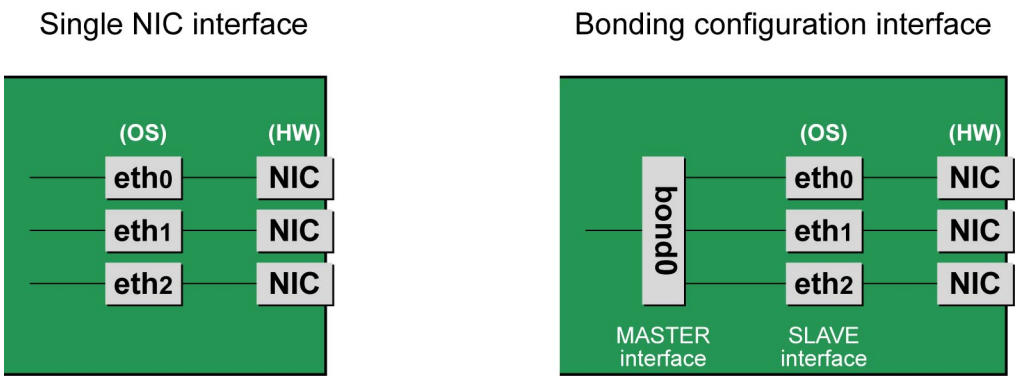

FIGURE 6.5 Single NIC interface and bonding configuration interface

NIC removal procedure

This section describes the procedure for hot plugging only a network card.

Note

When removing multiple NICs, be sure to remove them one by one. If you do this with multiple cards at the same time, the correct settings may not be made.

1. Confirm the slot number of the PCI slot that has the mounted interface.
   Confirm the interface mounting location through the configuration file information and the operating system information.
   First, confirm the bus address of the PCI slot that has the mounted interface to be removed.

```
# ls -l /sys/class/net/eth0/device
lrwxrwxrwx 1 root root 0 Sep 29 09:26 /sys/class/net \
/eth0/device
->../../../0000:00:01.2/0000:08:00.2/0000:0b:01.0
```

   The \ at the end of a line indicates that there is no line feed.

   Excluding the rest of the directory path, check the part corresponding to the file name in the symbolic link destination file of the output results. In the above example, the underlined part shows the bus address. ("0000:0b:01" in the example)
   Next, check the PCI slot number for this bus address.

```
# grep -il 0000:0b:01 /sys/bus/pci/slots/*/address
/sys/bus/pci/slots/20/address
```

   Read the output file path as shown below, and confirm the PCI slot number.

```
/sys/bus/pci/slots/<slot number>/address
```

   Notes

   If the above file path is not output, it indicates that the NIC is not mounted in a PCI slot (e.g., GbE port in the GSPB).

With the PCI slot number confirmed here, see D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers to check the mounting location, and see also B.1 Physical Mounting Locations of Components to identify the physical mounting location corresponding to the PCI slot number. You can confirm that it matches the mounting location of the operational target NIC.

2. Confirm each interface on the same NIC.
   If the NIC has multiple interfaces, you need to remove all of them. Confirm that all the interfaces that have the same bus address in a subsequent command

```
# ls -l /sys/class/net/*/device | grep "0000:0b:01"
lrwxrwxrwx 1 root root 0 Sep 29 09:26 /sys/class/net \
/eth0/device
->../../../0000:00:01.2/0000:08:00.2/0000:0b:01.0
lrwxrwxrwx 1 root root 0 Sep 29 09:26 /sys/class/net \
/eth1/device
->../../../0000:00:01.2/0000:08:00.2/0000:0b:01.1
```

   The \ at the end of a line indicates that there is no line feed.

   As the above example shows, when more than one interface is displayed, they are on the same NIC.

3. Execute the higher-level application processing required before NIC removal.
   Stop all access to the interface as follows. Stop the application that was confirmed in step 2 as using the interface, or exclude the interface from the target of use by the application.

4. Deactivate the NIC.
   Execute the following command to deactivate all the interfaces that you confirmed in step 2.
   The applicable command depends on whether the target interface is a single NIC interface or the SLAVE interface of a bonding device.
   [For a single NIC interface]

```
# /sbin/ifdown ethX
```

   If the single NIC interface has a VLAN device, you also need to remove the VLAN interface.
   Perform the following operations. (These operations precede deactivation of the physical interface.)

```
# /sbin/ifdown ethX.Y
# /sbin/vconfig rem ethX.Y
```

   [For the interface under bonding]
   If the bonding device is operating in mode 1, use the following steps for safety purposes on the SLAVE interface to be removed to exclude it from operation. In any other mode, removing it immediately should not cause any problems.

   Confirm that the SLAVE interface is the interface currently being used for communication.

```
# cat /sys/class/net/bondY/bonding/active_slave
```

If the displayed interface name corresponds to the SLAVE interface to be removed, execute the following command to switch to communicating now with the other SLAVE interface.

```
# /sbin/ifenslave -c bondY ethZ
   (ethZ: bondY-configured interface not subject to hot
replacement)
```

Finally, remove the SLAVE interface being replaced, from the bonding configuration.
Immediately after being removed, the interface is automatically no longer used.

```
# /sbin/ifenslave -d bondY ethX
```

To remove the interfaces, including the bonding device, deactivate them collectively by executing the following command.

```
# /sbin/ifdown bondY
```

5. Power off the PCI slot.
   Confirm that the /sys/bus/pci/slots directory contains a directory for the target slot information, which will be referenced and otherwise used. Below, the slot number confirmed in step 1 is shown at <slot number> in the directory path in the following format, where the directory is the operational target.

   ```
   /sys/bus/pci/slots/<slot number>
   ```

   To disable a PCI card and make it ready for removal, write "0" to the "power" file in the directory corresponding to the target slot. The LED goes out. The interface (ethX) is removed at the same time.

   ```
   # echo 0 > /sys/bus/pci/slots/<slot number>/power
   ```

6. Remove the NIC from the PCI slot.

7. Remove the interface configuration file.
   Delete the configuration files of all the interfaces confirmed in step 2, by executing the following command.

   ```
   # rm /etc/sysconfig/network-scripts/ifcfg-ethX
   ```

   When deleting a bonding device, also delete the related bonding items (ifcfg-bondYfiles).

8. Edit the settings in the udev function rule file.

The entries of the interface assigned to the removed NIC still remain in the udev function rule file, /etc/udev/rules.d/70-persistent-net.rules. Leaving the entries will affect the determination of interface names for replacement cards or added cards in the future. For this reason, delete or comment out those entries.
The following example shows editing of the udev function rule file, /etc/udev/rules.d/70-persistent-net.rules. (In this example, the file is edited when the eth10 interface is removed.)

[Example of descriptions in the file before editing]

```
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:38", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth0"
:
:
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:40", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth10"
```

The \ at the end of a line indicates that there is no line feed.

[Example of descriptions in the file after editing]
The entries for the eth10 interface are commented out.

```
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:38", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth0"
:
:
# SUBSYSTEM=="net", ACTION=="add", DRIVERS=="?*", \
ATTR{address}=="00:0e:0c:70:c3:40", ATTR{type}=="1", \
KERNEL=="eth*", NAME="eth10"
```

The \ at the end of a line indicates that there is no line feed.

Do this editing for all the interfaces confirmed in step 2.

9. Reflect the udev function rules.
   Since rules are not automatically reflected in udev at the removal time, take action to reflect the new rules in udev.

```
# udevadm control --reload-rules
```

10. If the removed interface includes any bonding interface, delete the driver setting of the interface.
    When removing a bonding interface, be sure to delete the setting corresponding to the bonding interface and driver. Execute the following command to check the descriptions in the configuration file, and confirm the setting corresponding to the bonding interface and driver.

    Example: Description in /etc/modprobe.d/bonding.conf

```
# grep -l bonding /etc/modprobe.d/*

/etc/modprobe.d/bonding.conf
```

Edit the file that describes the setting, and delete the setting of the removed bonding interface.

```
alias bondY bonding        <- Delete
```

bondY: Name of the removed bonding interface

Note

There are no means to dynamically remove the MASTER interface (bondY) of the bonding configuration. If you want to remove the entire bonding interface, you can disable the bonding configuration and remove all the SLAVE interfaces but the MASTER interface itself remains.
However, even if you have a MASTER interface with no SLAVE interface, continue operation as is because there will be no operational problems. The bonding interface will be completely removed at the next system startup.

11. Execute the higher-level application processing required after NIC removal.
    Perform the necessary post processing (such as changing application settings or restarting an application) for the operations performed for the higher-level applications in step 3.

CHAPTER 7 PCI Card Hot Maintenance in Windows

This chapter describes the hot plugging procedure for PCI cards in Windows. Hot plugging is supported only in Windows Server 2008/ Windows Server 2012.
This procedure is only for the PRIMEQUEST 1800E.
For the PRIMEQUEST 1800E2, contact the distributor where you purchased your product, or your sales representative.

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7.2 Common Hot Plugging Procedure for PCI Cards 184
7.3 NIC Hot Plugging 187
7.4 FC Card Hot Plugging 195
7.5 Hot Replacement Procedure for iSCSI 200

7.1 Overview of Hot Maintenance

The hot plugging procedure includes the common steps for all PCI cards and the additional steps required for a card function or driver. This section describes both the operations required for all cards and the operations required for combinations with a specific card and specific software.

Overview of hot plugging

You can add and replace cards by using the hot plugging supported by Windows Server 2008. This chapter describes the operating system commands required for card replacement, together with the actual hardware operations. For details on the overall flow, see 7.1.1 Overall flow.

Common hot plugging procedure for PCI cards

This chapter concretely describes the required tasks in the common replacement procedure for all PCI cards. For details on the common hot plugging procedure for PCI cards, see 7.2 Common Hot Plugging Procedure for PCI Cards.

Hot plugging procedure for each type of card

This chapter describes procedures with the required additional steps for certain cards. The section contain procedures for NICs (network cards) and FC cards (Fibre Channel cards). For details on NIC hot plugging, see 7.3 NIC Hot Plugging. For details on FC card hot plugging, see 7.4 FC Card Hot Plugging.

For the respective procedures required for cards other than the above cards, see the related hardware and software manuals as well as this chapter. Usually, these cards (NICs and FC cards) are used in a combination with duplication software (Intel PROSET/ETERNUS multipath driver). This chapter describes the procedure needed for a NIC or FC card used in combination with such duplication software, and the procedure needed for a NIC or FC card used alone.

Note

The procedures include operations for related software. Depending on the configuration, the procedures may differ or require additional operations. When doing the actual work, be sure to see the related product manuals.

7.1.1 Overall flow

This section shows the overall flow of hot plugging.

The following procedures are required for all types of cards for PCI Hot Plug support in the current version of Windows Server 2008. If an operation is required for a specific type of PCI card, the operation is described in the relevant procedure. The contents of an operation depend on the software to be combined with the card.

For details on the fjpciswap command, see 4.10 PCI Card Operation Command (fjpciswap) in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

Replacement procedure

1. Confirm the physical location by using the display function of the fjpciswap command.
2. Replace the PCI card by using the swap function of the fjpciswap command.

3. Confirm the replacement card by using the display function of the fjpciswap command.

Addition procedure

1. Add a PCI card by using the add function of the fjpciswap command.
2. Confirm the added card by using the display function of the fjpciswap command.

7.2 Common Hot Plugging Procedure for PCI Cards

This section describes the PCI card replacement procedure that does not involve additional steps (e.g., when a redundant application is not used).

Note

Insert the PCI card securely.

7.2.1 Replacement procedure

1. Confirm the physical location by using the display function of the fjpciswap command.

```
C:\>fjpciswap -l

Replaceable PCI cards are displayed
UnitName        Func      DeviceName
IOB#1-PCIC#5    FUNC#0    Intel(R) PRO/1000 PT Dual Port Server
Adapter #15
IOB#1-PCIC#5    FUNC#1    Intel(R) PRO/1000 PT Dual Port Server
Adapter #16

C:\>
```

2. Replace the PCI card by using the swap function of the fjpciswap command.

```
C:\>fjpciswap -r IOB#1-PCIC#5
Selected card name is
         Intel(R) PRO/1000 PT Dual Port Server Adapter #15
         Intel(R) PRO/1000 PT Dual Port Server Adapter #16

Please delete all settings about this card
Do you want to remove this card?(y/n)
y ←User input
```

When "Do you want to remove this card?(y/n)" appears, press the [y] key.

↓

```
Removing the card....
The card has removed.

Please replace the card, and input "y" key.
```

When "Please replace the card" appears, replace the PCI card.

↓

```
Please replace the card, and input "y" key.
y
Adding the card.............
The card has added.


C:\>
```

After replacing the PCI card, press the [y] key.

3. Confirm the replacement card by using the display function of the fjpciswap command.

```
C:\>fjpciswap -l

Replaceable PCI cards are displayed
UnitName        Func      DeviceName
IOB#1-PCIC#5    FUNC#0    Intel(R) PRO/1000 PT Dual Port Server
Adapter #15
IOB#1-PCIC#5    FUNC#1    Intel(R) PRO/1000 PT Dual Port Server
Adapter #16

C:\>
```

7.2.2 Addition procedure

1. Add a PCI card by using the add function of the fjpciswap command.
   Insert the PCI card into a PCI card slot. Then, specify the PCI card slot and execute the add command (-a).

```
C:\>fjpciswap -a IOB#1-PCIC#5
Adding the card.................
```

2. The card is recognized by the operating system. The command is completed.

```
C:\>fjpciswap -a IOB#1-PCIC#5
Adding the card.................
The card has added.

C:\>
```

3. Confirm the added card by using the display function of the fjpciswap command.

```
C:\>fjpciswap -l

Replaceable PCI cards are displayed
UnitName        Func      DeviceName
```

```
IOB#1-PCIC#5    FUNC#0    Intel(R) PRO/1000 PT Dual Port Server
Adapter #15
IOB#1-PCIC#5    FUNC#1    Intel(R) PRO/1000 PT Dual Port Server
Adapter #16

C:\>
```

7.2.3 About removal

Note

Windows does not support PCI card removal.

7.3 NIC Hot Plugging

For NIC hot plugging (replacement), you need to especially consider other matters in addition to the procedure described in 7.2 Common Hot Plugging Procedure for PCI Cards.
This section describes NIC hot plugging combined with teaming.

For details on the fjpciswap command, see 4.10 PCI Card Operation Command (fjpciswap) in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

7.3.1 Hot plugging a NIC incorporated into teaming

This section describes the hot plugging procedure for a NIC incorporated into teaming.

Note

- Be sure to perform hot plugging after removing the card. If the card is not removed, the operating system may stop.
- There are some precautions on teaming with Intel PROSet(R). For details on the precautions, see G.8 NIC (Network Interface Card).

1. Confirm the physical location by using the display function of the fjpciswap command. Here, replace IOB-PCIC#5.

```
C:\>fjpciswap -l

Replaceable PCI cards are displayed
UnitName        Func      DeviceName
IOB#1-PCIC#4    FUNC#0    Emulex LightPulse LPe1250-F8, PCI Slot
4, \
Storport Miniport Driver
IOB#1-PCIC#5    FUNC#0    Team: Team #0 - Intel(R) PRO/1000 PT \
Dual Port Server Adapter #15
IOB#1-PCIC#5    FUNC#1    Intel(R) PRO/1000 PT Dual Port Server \
Adapter #16
IOB#1-PCIC#7    FUNC#0    Team: Team #0 - Intel(R) PRO/1000 PT \
Dual Port Server Adapter #23
IOB#1-PCIC#7    FUNC#1    Intel(R) PRO/1000 PT Dual Port Server
Adapter #24

C:\>
```

   The \ at the end of a line indicates that there is no line feed.

2. From the Device Manager, select the interface to be deleted, and click [Properties].

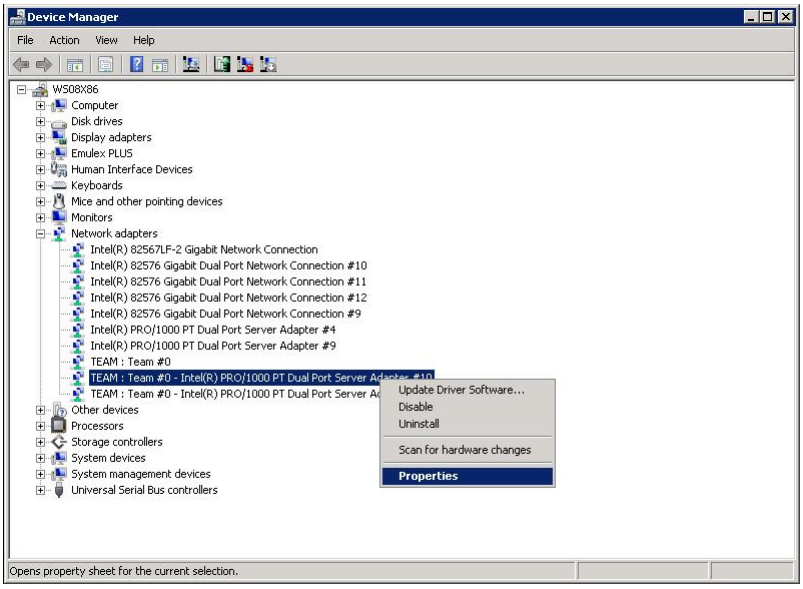


FIGURE 7.1 [Device Manager] window

3. Click the [Teaming] tab, uncheck the [Team this adapter with other adapters] check box, and click the [OK] button.

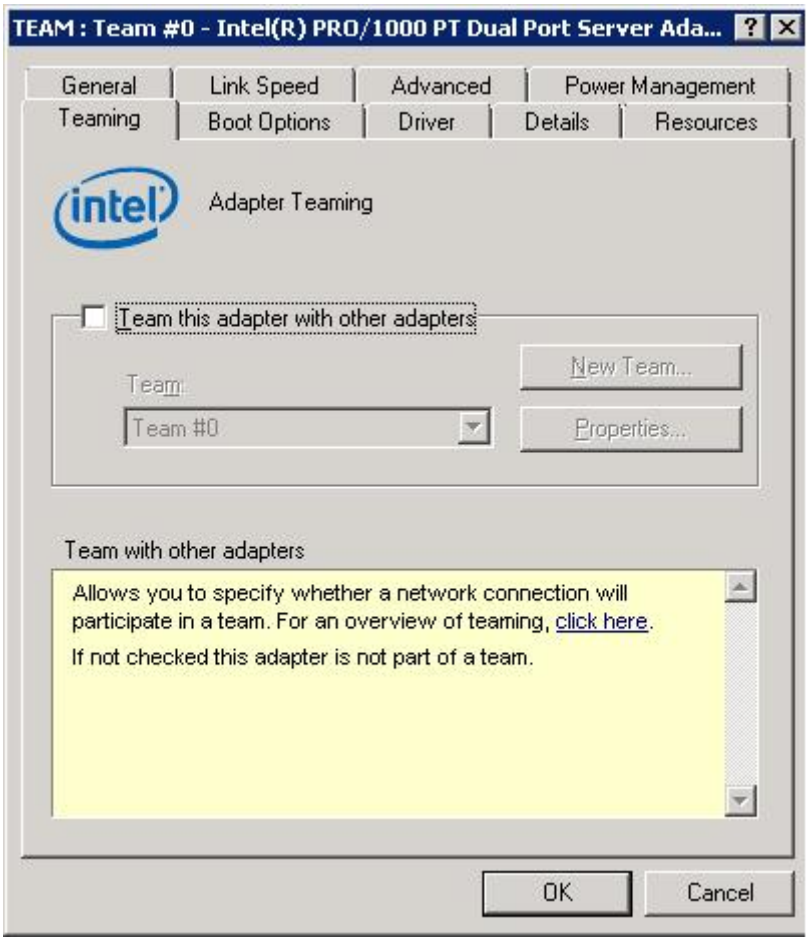


FIGURE 7.2 [Teaming] tab

4. The following message appears. Click the [Yes] button.

FIGURE 7.3 [Adapter Teaming] properties

5. Confirm DeviceName by using the display function of the fjpciswap command. Confirm that the NIC is not incorporated into teaming.

```
C:\>fjpciswap -l

Replaceable PCI cards are displayed
UnitName      Func    DeviceName
IOB#1-PCIC#4  FUNC#0  Emulex LightPulse LPe1250-F8, PCI Slot 4, \
Storport Miniport Driver
IOB#1-PCIC#5  FUNC#0  Intel(R) PRO/1000 PT Dual Port Server
Adapter #15
IOB#1-PCIC#5  FUNC#1  Intel(R) PRO/1000 PT Dual Port Server
Adapter #16
IOB#1-PCIC#7  FUNC#0  Team: Team #0 - Intel(R) PRO/1000 PT \
Dual Port Server Adapter #23
IOB#1-PCIC#7  FUNC#1  Intel(R) PRO/1000 PT Dual Port Server
Adapter #24

C:\>
```

The \ at the end of a line indicates that there is no line feed.

6. Replace the NIC by executing the fjpciswap command.

```
C:\>fjpciswap -r IOB#1-PCIC#5
Selected card name is
         Intel(R) PRO/1000 PT Dual Port Server Adapter #15
         Intel(R) PRO/1000 PT Dual Port Server Adapter #16

Please delete all settings about this card
Do you want to remove this card?(y/n)
y
Removing the card......
The card has removed.

Please replace the card, and input "y" key.
y
```

```
Adding the card..............
The card has added.


C:\>
```

When "Please replace the card" appears, replace the NIC, and insert the cable. After replacing the NIC, press the [y] key.

7. Confirm that the NIC was normally replaced by using the display function of the fjpciswap command.

```
C:\>fjpciswap -l

Replaceable PCI cards are displayed
UnitName      Func    DeviceName
IOB#1-PCIC#4  FUNC#0  Emulex LightPulse LPe1250-F8, PCI Slot 4, \
Storport Miniport Driver
IOB#1-PCIC#5  FUNC#0  Intel(R) PRO/1000 PT Dual Port Server
Adapter #15
IOB#1-PCIC#5  FUNC#1  Intel(R) PRO/1000 PT Dual Port Server
Adapter #16
IOB#1-PCIC#7  FUNC#0  Team: Team #0 - Intel(R) PRO/1000 PT \
Dual Port Server Adapter #23
IOB#1-PCIC#7  FUNC#1  Intel(R) PRO/1000 PT Dual Port Server
Adapter #24

C:\>
```

The \ at the end of a line indicates that there is no line feed.

8. After completing the replacement, open the Device Manager and open the properties dialog box of the NIC to be incorporated into teaming.

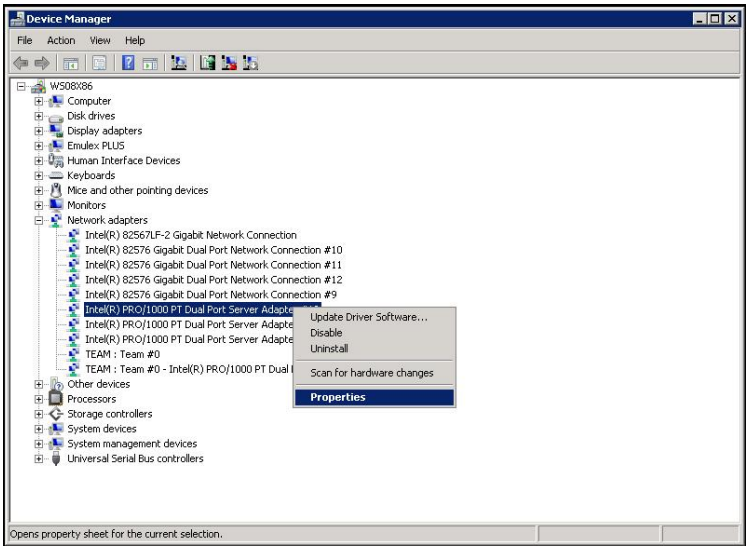


FIGURE 7.4 [Device Manager] window

9. On the [Teaming] tab, check [Team this adapter with other adapters], select the team into which the adapter was incorporated before the replacement, and click the [OK] button.

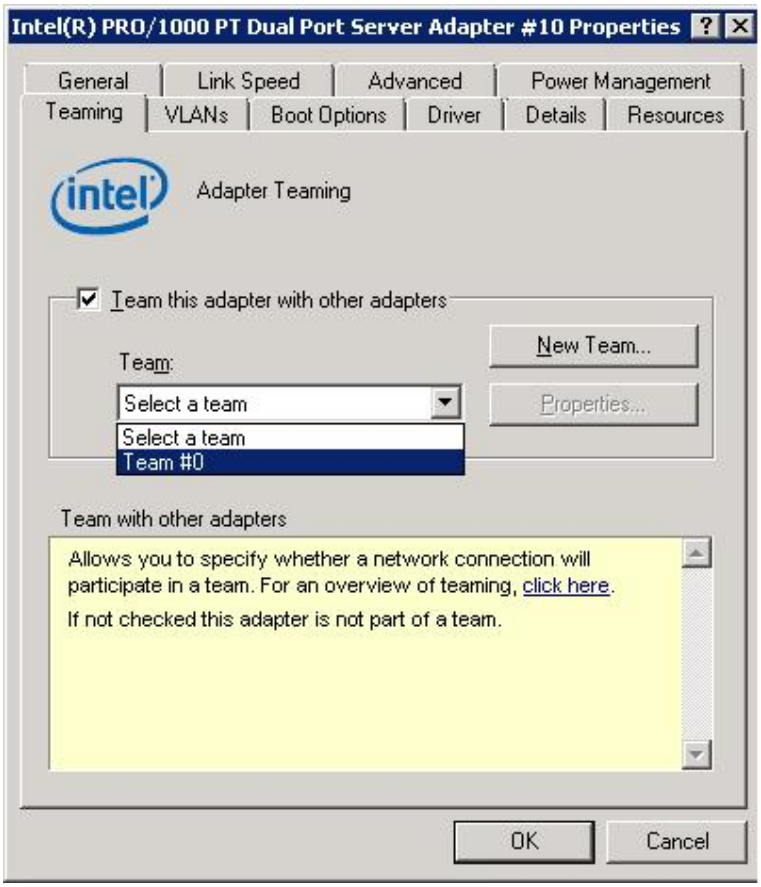


FIGURE 7.5 [Teaming] tab

10. In the Device Manager, confirm that the NIC is incorporated into the team.

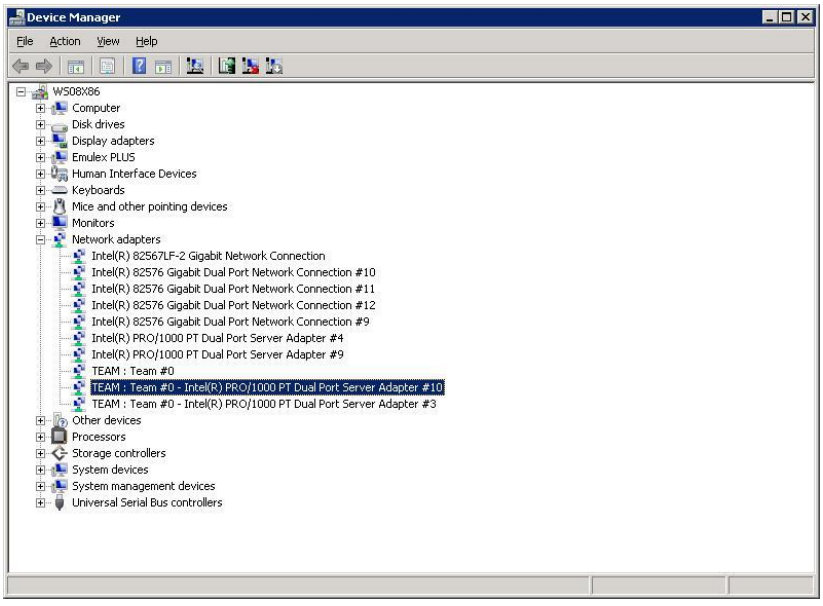

Device Manager
File
Action
View
Help
WS08X86
Computer
Disk drives
Display adapters
Emulex PLUS
Human Interface Devices
Keyboards
Mice and other pointing devices
Monitors
Network adapters
Intel(R) 82567LF-2 Gigabit Network Connection
Intel(R) 82576 Gigabit Dual Port Network Connection #10
Intel(R) 82576 Gigabit Dual Port Network Connection #11
Intel(R) 82576 Gigabit Dual Port Network Connection #12
Intel(R) 82576 Gigabit Dual Port Network Connection #9
Intel(R) PRO/1000 PT Dual Port Server Adapter #4
Intel(R) PRO/1000 PT Dual Port Server Adapter #9
TEAM : Team #0
TEAM : Team #0 - Intel(R) PRO/1000 PT Dual Port Server Adapter #10
TEAM : Team #0 - Intel(R) PRO/1000 PT Dual Port Server Adapter #3
Other devices
Processors
Storage controllers
System devices
System management devices
Universal Serial Bus controllers

FIGURE 7.6 [Device Manager] window

11. Execute the command that incorporates teaming information into server management software.

```
C:\>fjpciswap -f

C:\>
```

7.3.2 Hot plugging a non-redundant NIC

This section describes the hot plugging procedure in networks without redundancy (a NIC is not incorporated into teaming).
For the PRIMEQUEST 1800E, perform operations from the PSA Web-UI.

1. Confirm the physical location by using the display function of the fjpciswap command. Here, replace IOB#1-PCIC#5.

```
C:\>fjpciswap -l

Replaceable PCI cards are displayed
UnitName         Func      DeviceName
IOB#1-PCIC#5     FUNC#0    Intel(R) PRO/1000 PT Dual Port Server
Adapter #15
IOB#1-PCIC#5     FUNC#1    Intel(R) PRO/1000 PT Dual Port Server
Adapter #16

C:\>
```

2. Disable the relevant device by using the Device Manager.

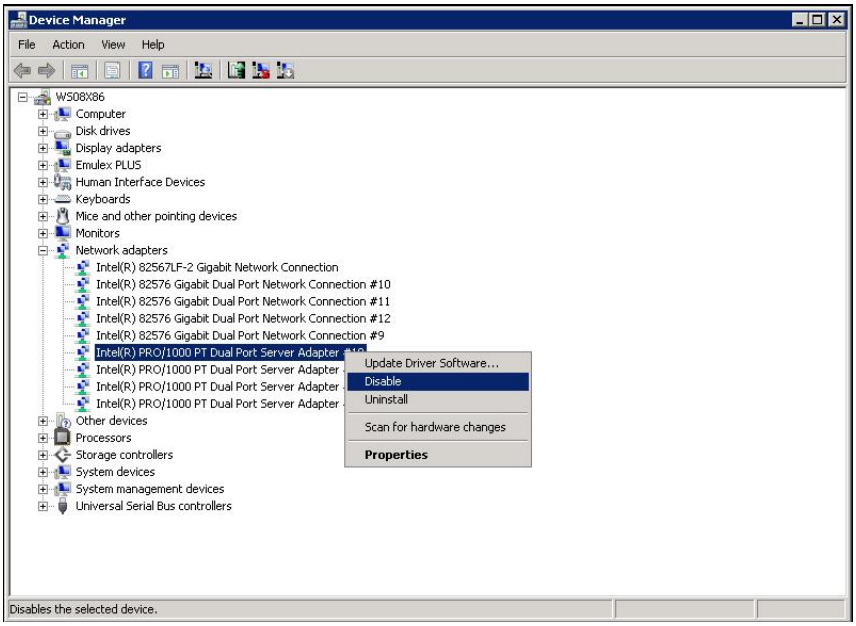


FIGURE 7.7 [Device Manager] window

3. Replace the corresponding NIC by using the fjpciswap command.

```
C:\>fjpciswap -r IOB#1-PCIC#5
Selected card name is
         Intel(R) PRO/1000 PT Dual Port Server Adapter #15
         Intel(R) PRO/1000 PT Dual Port Server Adapter #16

Please delete all settings about this card
Do you want to remove this card?(y/n)
y
Removing the card....
The card has removed.

Please replace the card, and input "y" key.
y
Adding the card..............
The card has added.


C:\>
```

When "Please replace the card" appears, replace the NIC, and insert the cable. After replacing the NIC, press the [y] key.

4. Start the command prompt. Display a list of hot replacement enable PCI cards by using the fjpciswap command. Confirm that the added card is correctly displayed.

```
C:\>fjpciswap -l

Replaceable PCI cards are displayed
UnitName        Func      DeviceName
IOB#1-PCIC#5    FUNC#0    Intel(R) PRO/1000 PT Dual Port Server
Adapter #15
IOB#1-PCIC#5    FUNC#1    Intel(R) PRO/1000 PT Dual Port Server
Adapter #16

C:\>
```

5. As shown in FIGURE 7.8 [Device Manager] window, right-click the target device on Device Manager, and select [Enable] if it is available in the displayed menu. (If [Disable] is displayed, skip this step.)

   Note

   For up to 30 minutes after the target device is enabled, the [MAC Address] item in the [Ethernet Controller] window of the Web-UI of PSA displays a hyphen (-).

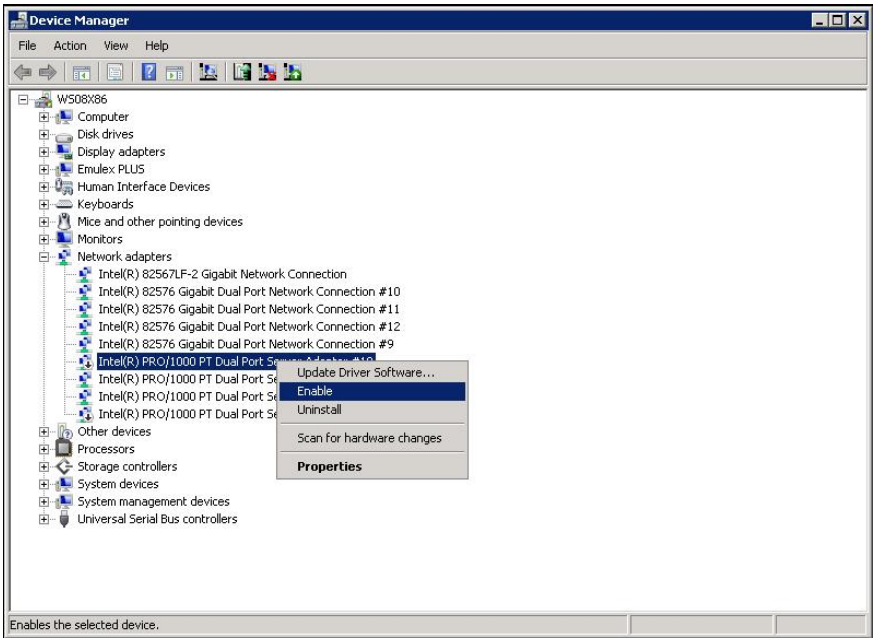


FIGURE 7.8 [Device Manager] window

7.3.3 NIC addition procedure

Referring to 7.2 Common Hot Plugging Procedure for PCI Cards, add a NIC.

7.4 FC Card Hot Plugging

For FC card hot plugging (replacement), you need to especially consider other matters in addition to the procedure described in 7.2 Common Hot Plugging Procedure for PCI Cards.
The hot plugging of an FC card changes the WWN of the FC card if the WWN is set on an FC switch or RAID device (ETERNUS). For details on how to set the WWN again for a new card, see the respective device manuals.
This section describes hot plugging of an FC card combined with ETERNUS MPD (multipath driver).
For details on the fjpciswap command, see 4.10 PCI Card Operation Command (fjpciswap) in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

Notes

- SAN boot paths are not valid.
- LTO library devices are not supported.
- Depending on the Windows specifications, if the FC card connection destination has a Page File or other such paging scheme, FC card hot plugging may not be supported.
- The error message "Source: FJSVpsa, ID: 25004" may be output to the event log during the replacement procedure. This message does not indicate any problem.

7.4.1 Hot plugging an FC card incorporated with the ETERNUS multipath driver

This section describes the hot plugging procedure for an FC card incorporated with the ETERNUS multipath driver.

1. From the MMB Web-UI, click [Partition] - [Partition#N] - [PSA] - [PCI Devices] to search for the FC card to be replaced.
   You can search for the FC card to be replaced from the Unit names or BUS numbers.
   Suppose that you are going to replace IOB#1-PCIC#4. The red box indicates the target device.

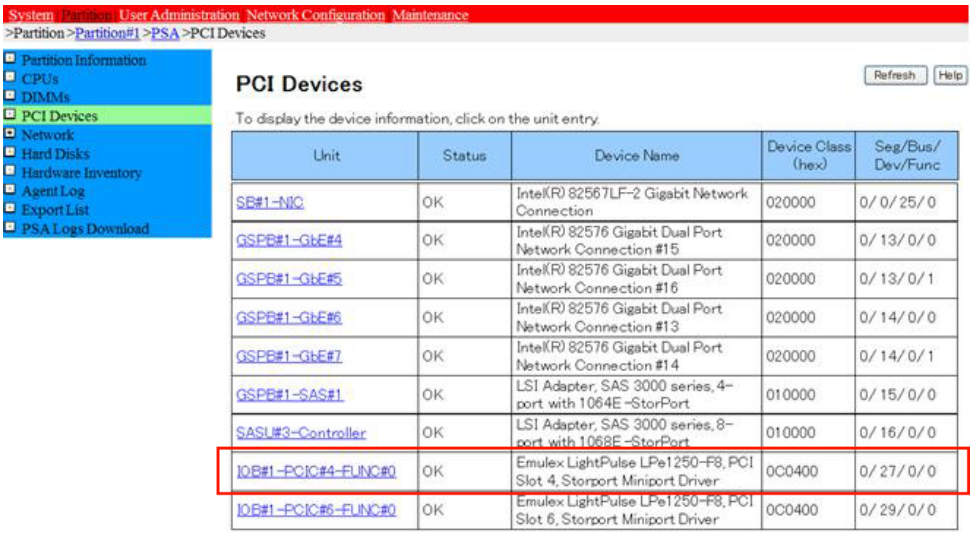


FIGURE 7.9 [PCI Devices] window

Remarks

Some multifunction cards differ only in the part after FUNC in the Unit name. Also, some differ only in the Func number at [Seg/Bus/Dev/Func]. Perform the following steps 2 and 3 for each of these multifunction cards.

2. Select the UNIT name of the FC card to be replaced, open the [Fibre Channel] window, and record the "WWN (hex)" value of the replacement device.

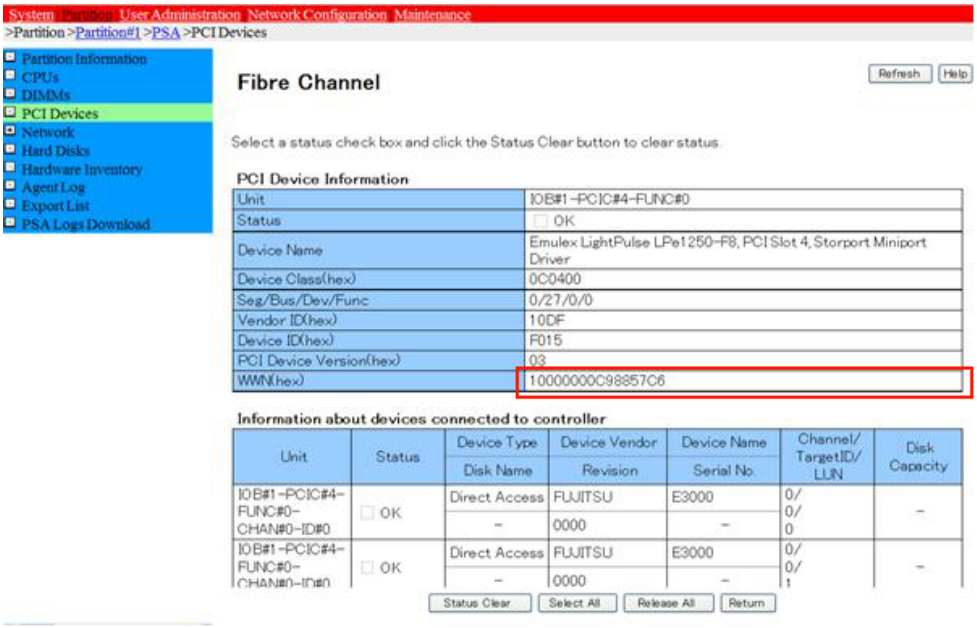


FIGURE 7.10 [Fibre Channel] window

3. Start HBAnywhere and acquire the port number of the replacement device based on the WWN acquired in step 2.
   From the left pane, select the relevant WWN. From the right pane, click the [Port Information] tab. The information displayed in [OS Device Name] is a port number (in the following example, \\.\Scsi2).

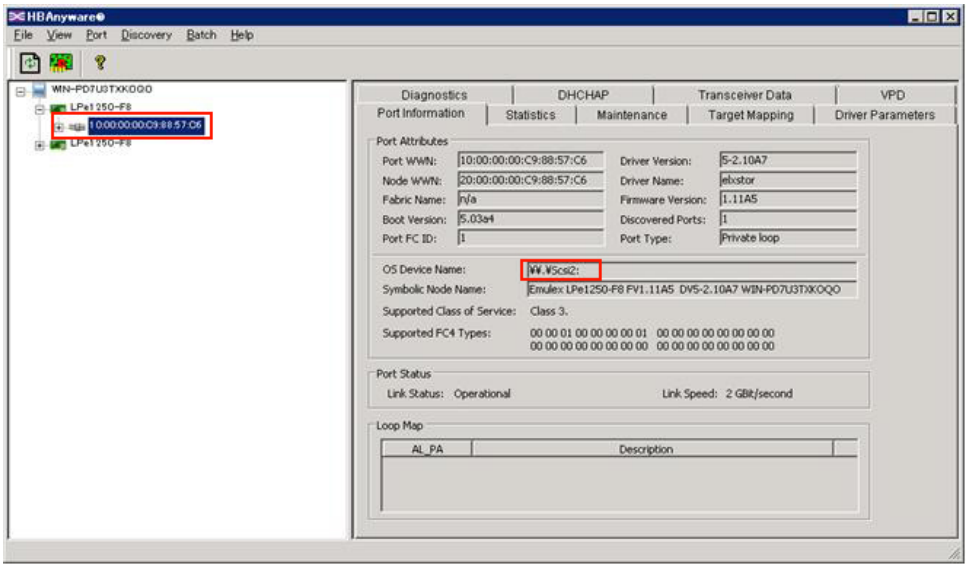


FIGURE 7.11 HBAnyware

4. Start ETERNUS Multipath Manager and place all the devices to be replaced offline.

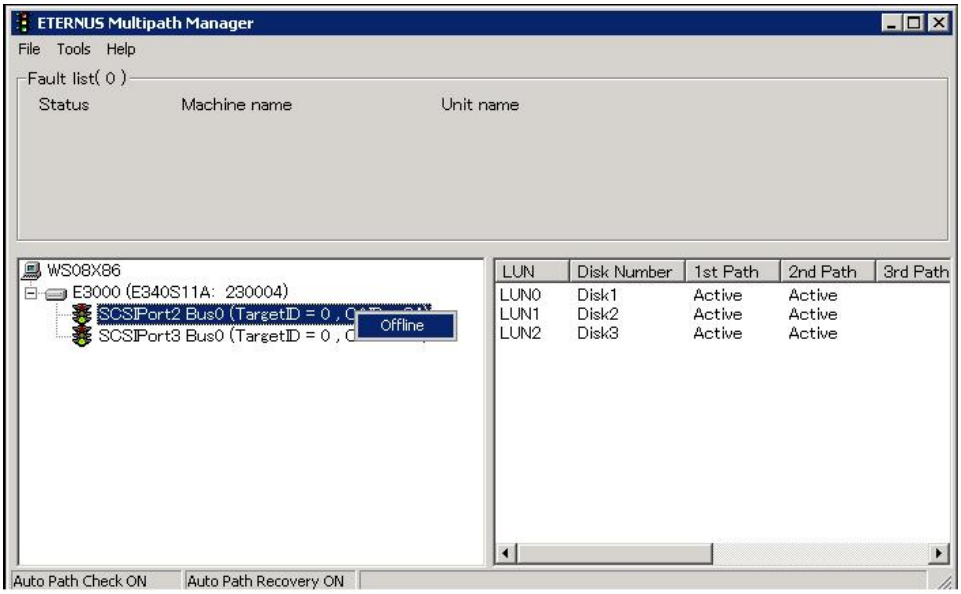


FIGURE 7.12 ETERNUS Multipath Manager

5. Replace the FC card by executing the following command.
   Exit ETERNUS Multipath Manager and HBAnywhere. Replace the relevant card by using the replacement function of the fjpciswap command.

```
C:\>fjpciswap -r IOB#1-PCIC#4
Selected card name is
         Emulex LightPulse LPe1250-F8, PCI Slot 4, Storport
Miniport Driver

Please delete all settings about this card
Do you want to remove this card?(y/n)
y
Removing the card.....
The card has removed.

Please replace the card, and input "y" key.
y
Adding the card..............
The card has added.


C:\>
```

   When "Please replace the card" appears, replace the FC card, and insert the cable. After replacing the FC card, press the [y] key.

   Remarks

   The process may stop with the following message. This message is displayed if an application is referencing the FC card or if the card was replaced soon after the device went offline.

Check whether any application is referencing the FC card. If no application is referencing the card, wait about 10 minutes and reexecute the command. Depending on the configuration, it may take a much longer time to replace the FC card.

```
C:\>fjpciswap -r IOB#1-PCIC#4
Selected card name is
         Emulex LightPulse LPe1250-F8, PCI Slot 4, Storport
Miniport Driver

Please delete all settings about this card
Do you want to remove this card?(y/n)
y
Removing the card...
FJSVpsa : E 08745 internal error :Device_Eject failed:PCI
\VEN_10DF&DEV_F015& \
SUBSYS_F01510DF&REV_03\8&39e14fc5&0&00000008
0048:23:679

C:\>
```

The \ at the end of a line indicates that there is no line feed.

6. Confirm the FC card installation by using the fjpciswap command.

```
C:\>fjpciswap -l

Replaceable PCI cards are displayed
UnitName      Func    DeviceName
IOB#1-PCIC#4  FUNC#0  Emulex LightPulse LPe1250-F8, PCI Slot 4, \
Storport Miniport Driver
IOB#1-PCIC#6  FUNC#0  Emulex LightPulse LPe1250-F8, PCI Slot 6, \
Storport Miniport Driver

C:\>
```

The \ at the end of a line indicates that there is no line feed.

7. Start ETERNUS Multipath Manager and place all the replaced devices online. Confirm that the devices are normally incorporated with the multipath driver.

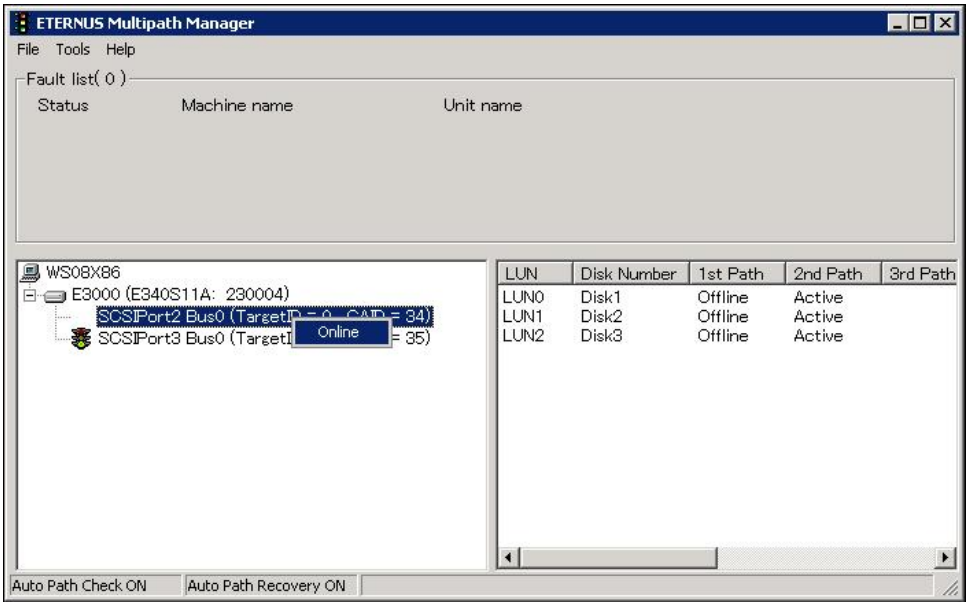


FIGURE 7.13 ETERNUS Multipath Manager

7.4.2 FC card addition procedure

Referring to 7.2 Common Hot Plugging Procedure for PCI Cards, add an FC card.

7.5 Hot Replacement Procedure for iSCSI

The prerequisites for iSCSI (NIC) hot replacement are as follows.

- The target system runs Windows Server 2008 or later.
- The maintenance person has the Administrator privileges required for operations.
- The ETERNUS multipath driver (MPD) has been applied.
- To replace more than one card, one card at a time will be replaced.

For details on the fjpciswap command, see Section 4.10 PCI Card Operation Command (fjpciswap) in Chapter 4 PSA CLI (Command Line Interface) Operations in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

7.5.1 Confirming the incorporation of a card with MPD

This section describes the procedure for confirming that a card has been incorporated with MPD.

- Windows Server 2008

1. From the MMB Web-UI, click [Partition] - [Partition#N] - [PSA] - [PCI Devices] to search for the NIC to be replaced. You can search for the NIC to be replaced from the Unit names or BUS numbers.
   Suppose that you are going to replace IOB#0-PCIC#7. The red box indicates the target device.

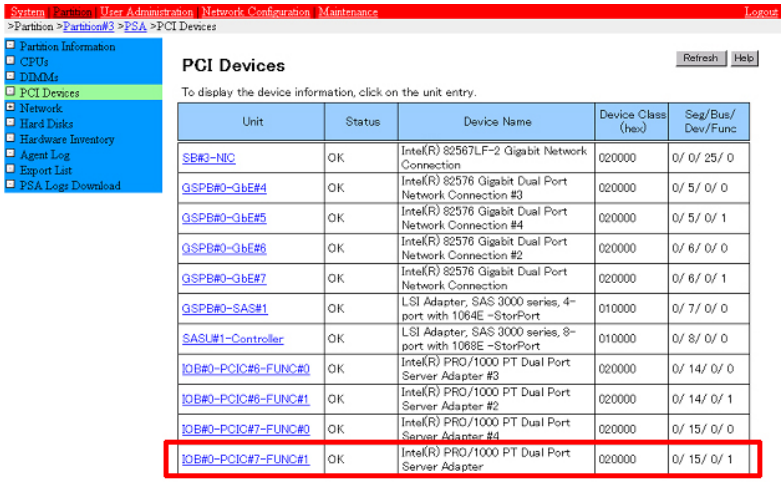


FIGURE 7.14 [PCI Devices] window

Some multifunction cards differ only in the part after FUNC in the Unit name. Also, some differ only in the Func number at [Seg/Bus/Dev/Func]. Perform the following steps 2 to 9 for each of these multifunction cards.

2. Select the Unit name of the NIC to be replaced to open the [Ethernet Controller] window. Record the "IP Address" and "IP Subnet Mask" values under "IP v4 Interfaces" in order to search for the device to be replaced or set these values again after replacement.

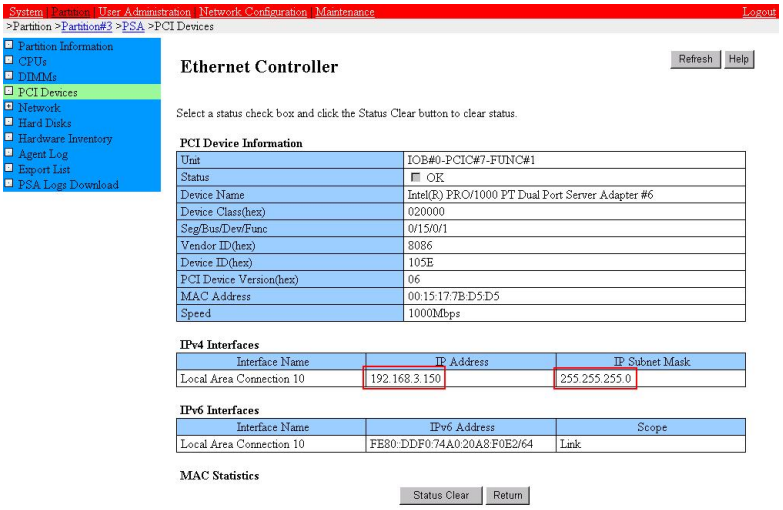


FIGURE 7.15 [Ethernet Controller] window

3. Start iSCSI Initiator.

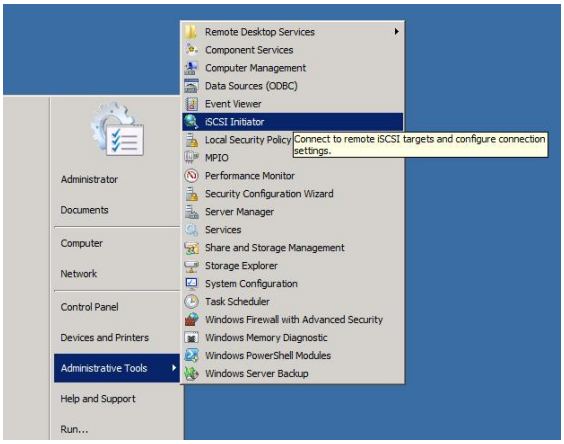


FIGURE 7.16 Starting [iSCSI Initiator]

The following steps 4 to 9 vary depending on the version, Windows Server 2008 or Windows Server 2008 R2 or later.

4. Click the [Targets] tab in the [iSCSI Initiator Properties] window. One of the targets displayed in [Targets] is connected to the NIC to be replaced. If you know which target, select the target, click the [Details] button, and proceed to step 8. If you do not know, select any target, click the [Details] button, and proceed to step 5.

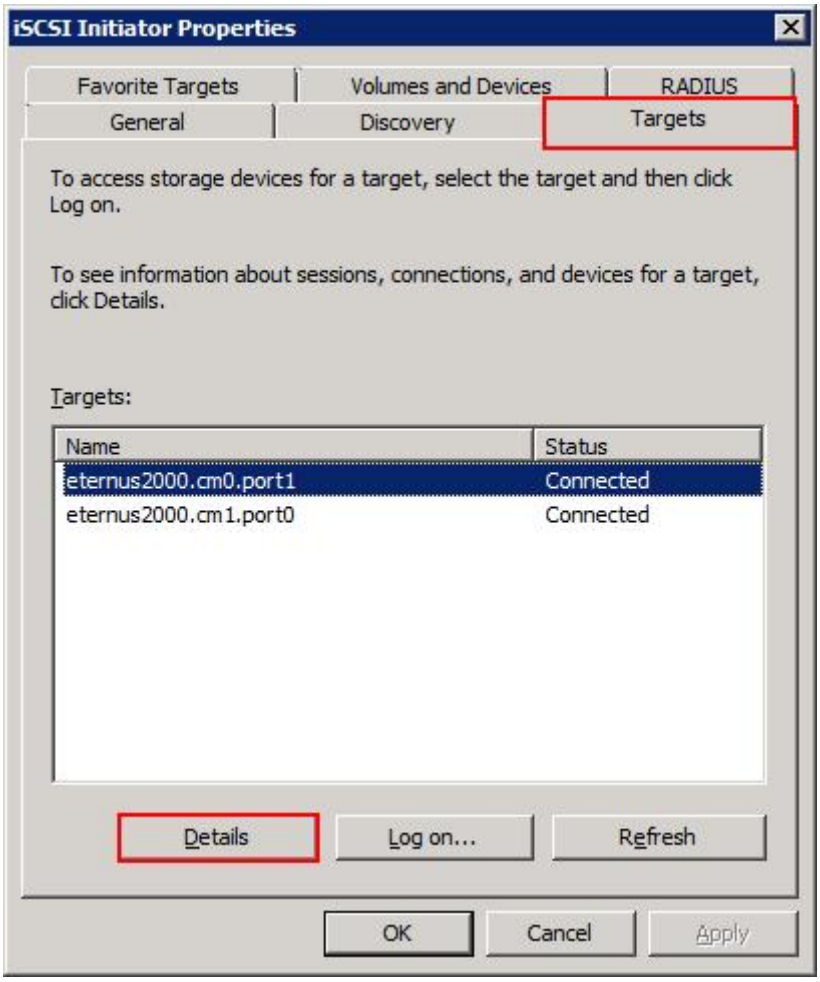


FIGURE 7.17 [iSCSI Initiator Properties] window (in Windows Server 2008)

5. Click the [Sessions] tab in the [Target Properties] window, and click the [Connections] button.

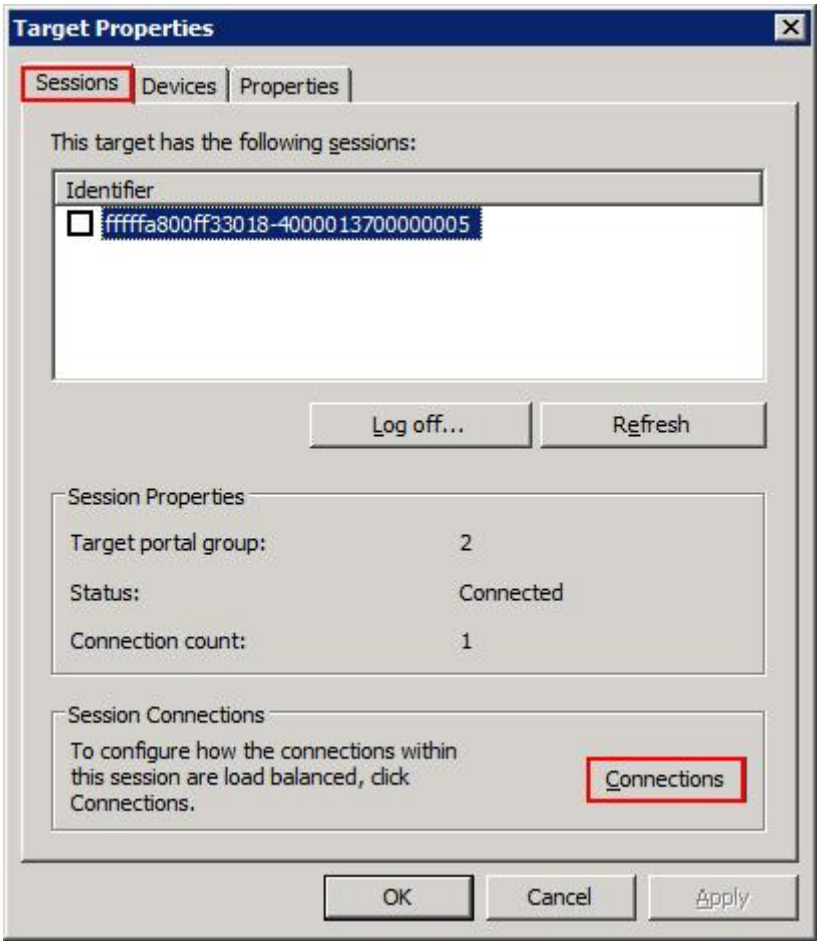


FIGURE 7.18 [Target Properties] window

6. The [Source Portal] column in the [Session Connections] window displays IP addresses. Check whether any IP address matches that recorded in step 2.
   If an IP address matches (192.168.3.150, in this example), this is the target connected to the device to be replaced.

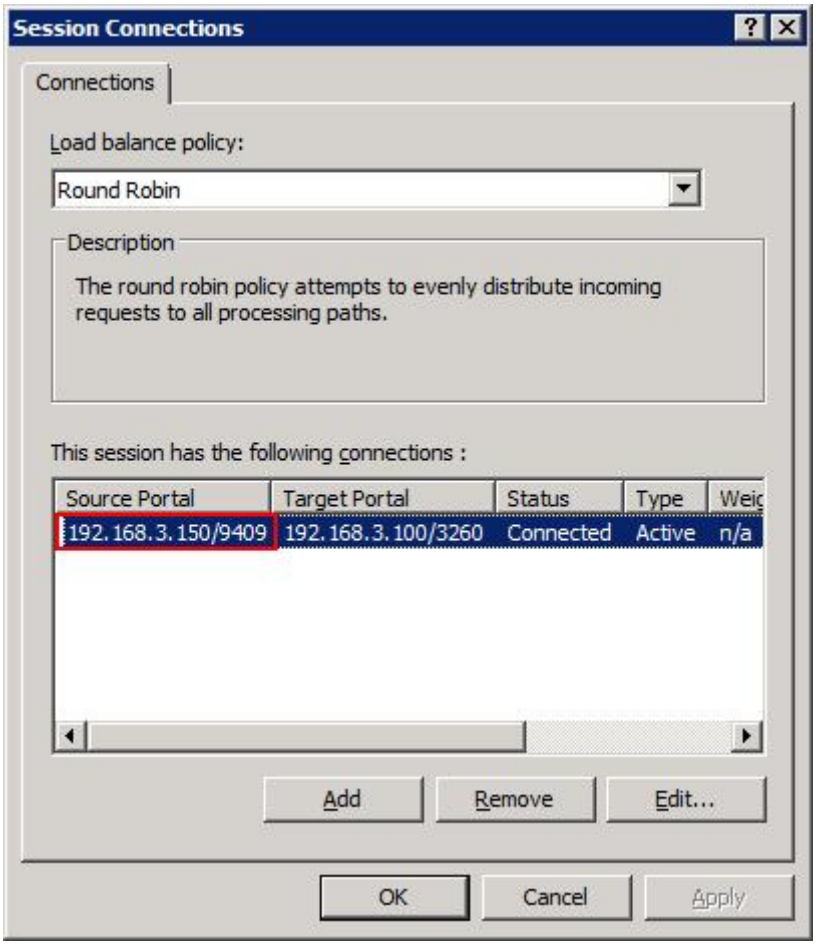


FIGURE 7.19 [Session Connections] window

7. If no IP address in step 6 matches, repeat steps as follows.
    1. Click the [Cancel] button to return to the [Target Properties] window shown in step 5.
    2. Click the [Cancel] button again to return to the [iSCSI Initiator Properties] window shown in step 4.
    3. Select the next target, and repeat the steps after step 4.

    If an IP address matches, click the [Cancel] button to return to the [Target Properties] window shown in step 5, and proceed to step 8.

8. Click the [Devices] tab in the [Target Properties] window, and click the [Advanced] button.

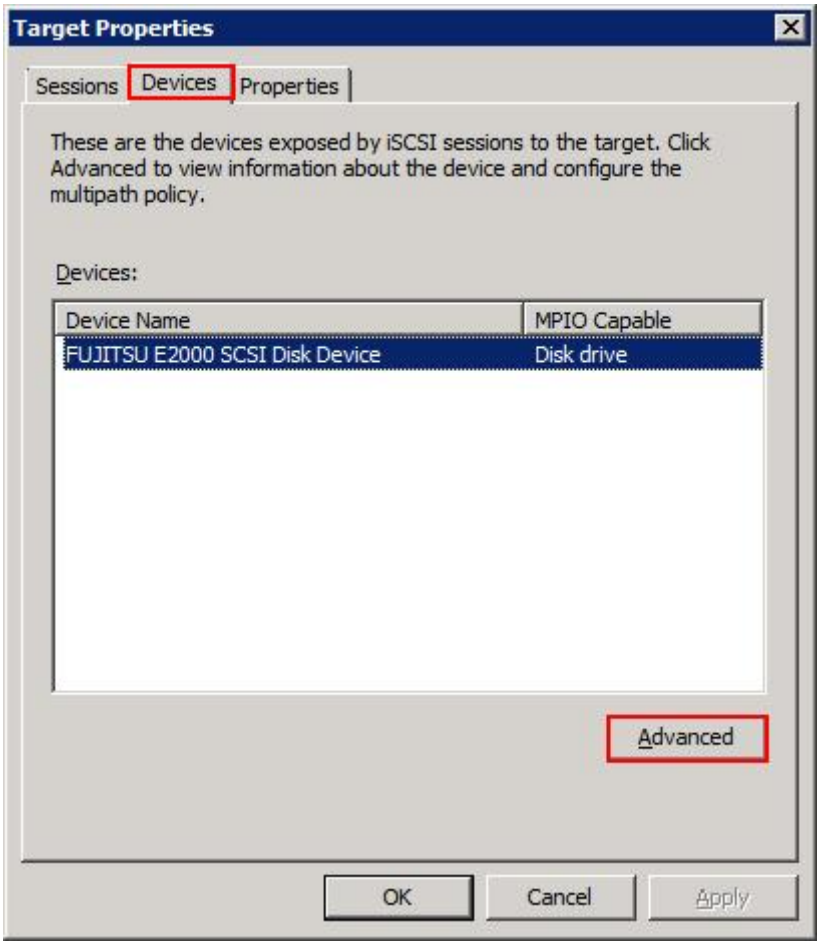


FIGURE 7.20 [Target Properties] window

9. Record the values displayed on the [SCSI address] line in the [Device Details] window (Port 2, Bus 0, Target ID 0, LUN 0, in this example).

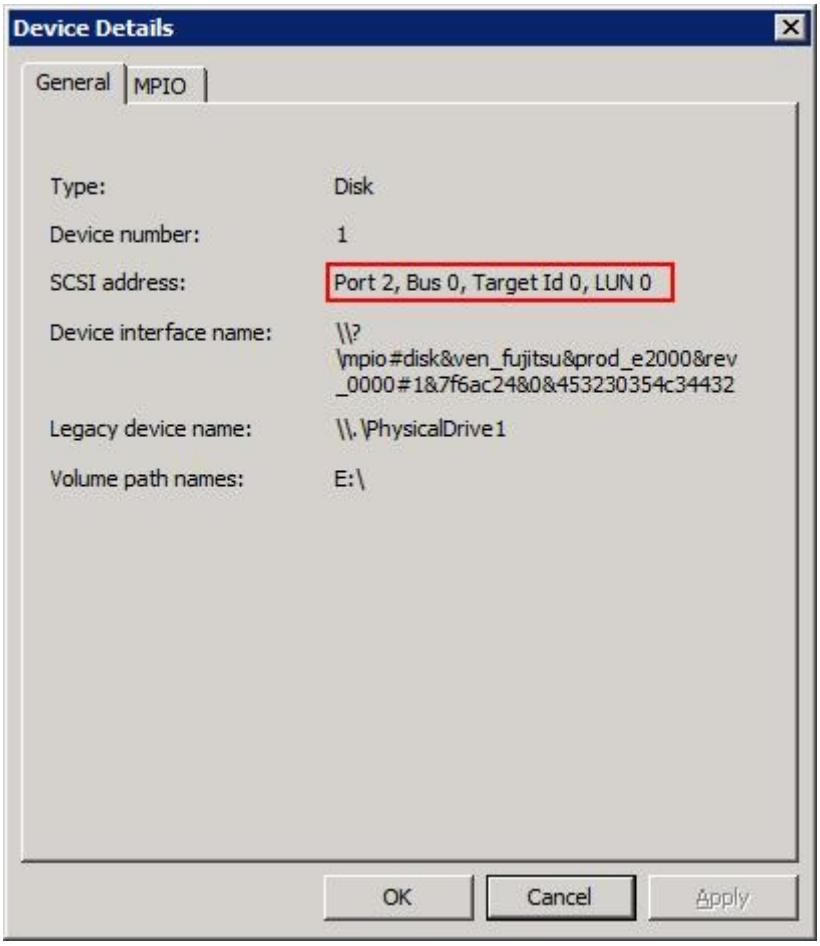


FIGURE 7.21 [Device Details] window

- Windows Server 2008 R2

1. From the MMB Web-UI, click [Partition] - [Partition#N] - [PSA] - [PCI Devices] to search for the NIC to be replaced. You can search for the NIC to be replaced from the Unit names or BUS numbers.
   Suppose that you are going to replace IOB#0-PCIC#7. The red box indicates the target device.

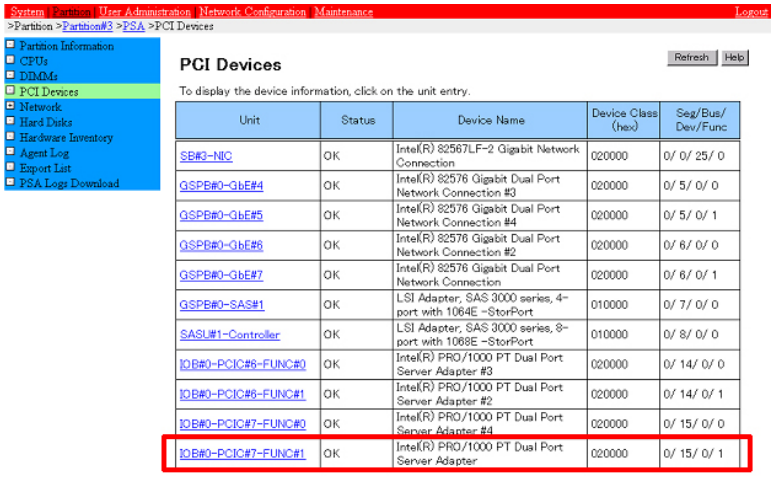


FIGURE 7.22 [PCI Devices] window

Some multifunction cards differ only in the part after FUNC in the Unit name. Also, some differ only in the Func number at [Seg/Bus/Dev/Func]. Perform the following steps 2 to 9 for each of these multifunction cards.

2. Select the Unit name of the NIC to be replaced to open the [Ethernet Controller] window. Record the "IP Address" and "IP Subnet Mask" values under "IP v4 Interfaces" in order to search for the device to be replaced or set these values again after replacement.

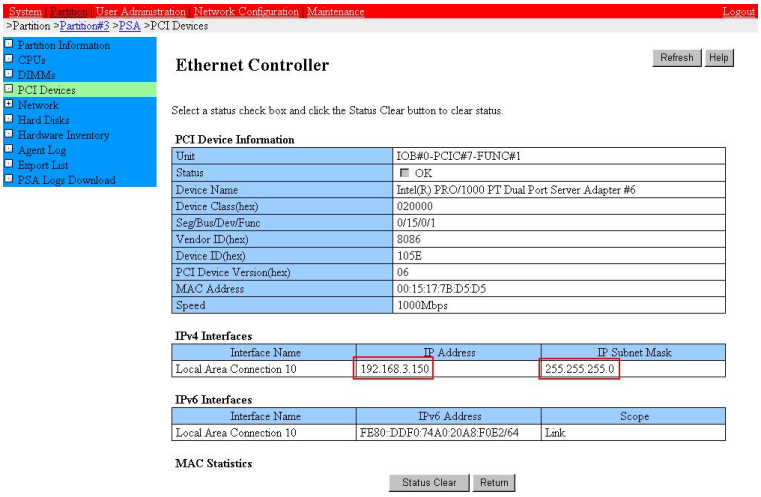


FIGURE 7.23 [Ethernet Controller] window

3. Start iSCSI Initiator.

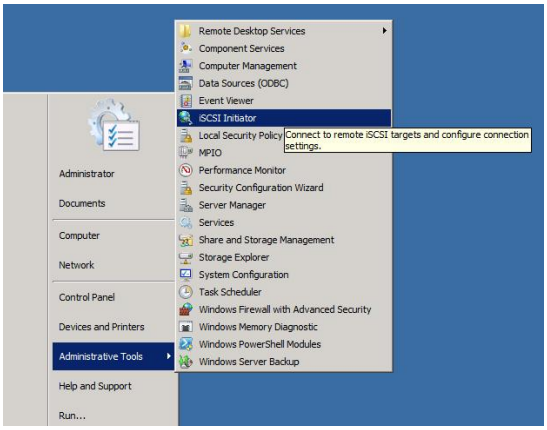


FIGURE 7.24 [iSCSI Initiator]

4. Click the [Targets] tab in the [iSCSI Initiator Properties] window. One of the targets displayed in [Discovered targets] is connected to the NIC to be replaced. If you know which target, select the target, click the [Devices] button, and proceed to step 9.
   If you do not know, select any target, click the [Properties] button, and proceed to step 5.

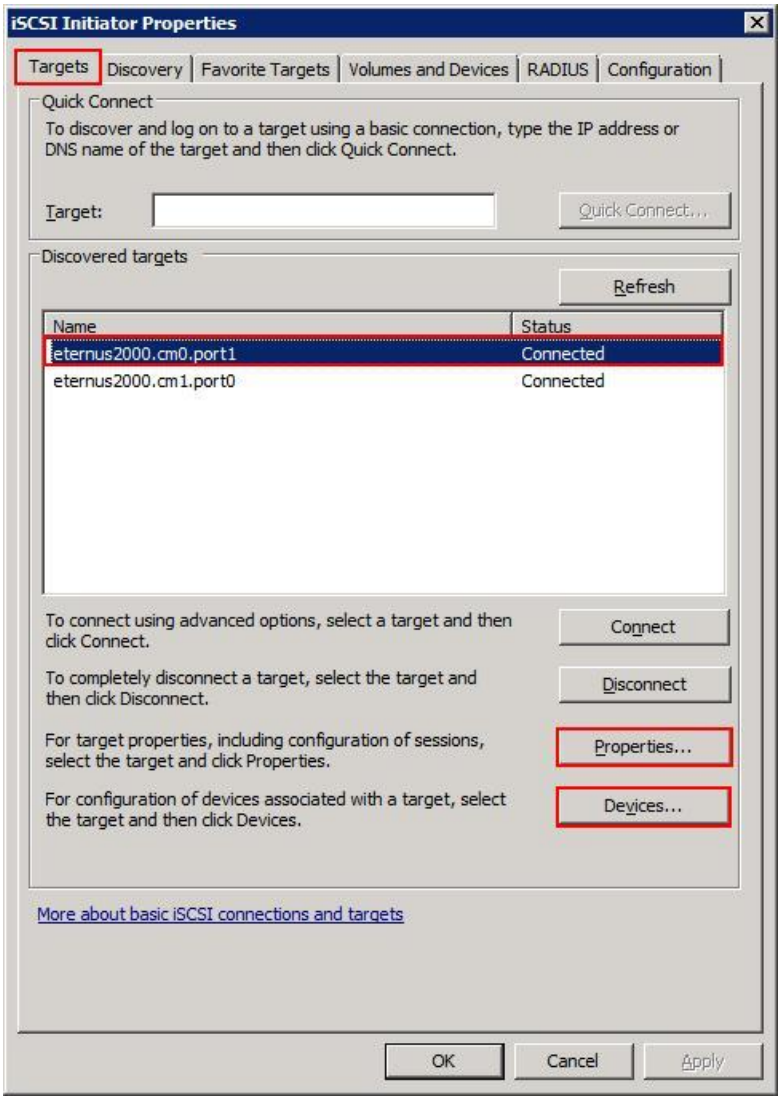


FIGURE 7.25 [iSCSI Initiator Properties] window (in Windows Server 2008 R2)

5. Click the [Sessions] tab in the [Properties] window, and click the [MCS] button.

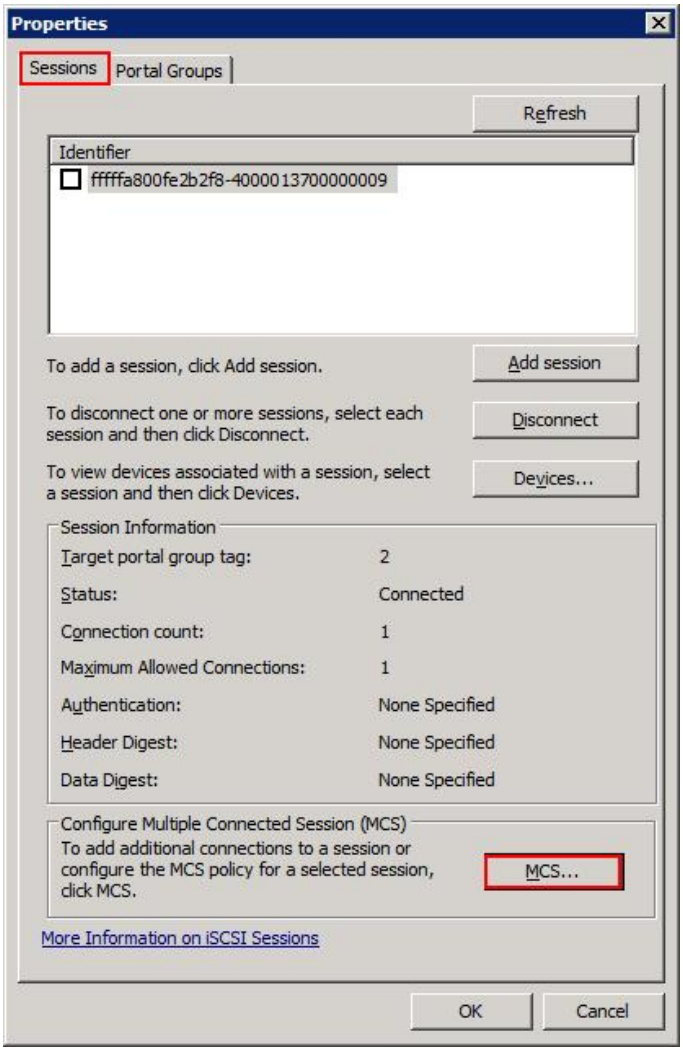

Properties
Sessions
Portal Groups
Refresh
Identifier
fffffa800fe2b2f8-4000013700000009
To add a session, click Add session.
Add session
To disconnect one or more sessions, select each session and then click Disconnect.
Disconnect
To view devices associated with a session, select a session and then click Devices.
Devices...
Session Information
Target portal group tag: 2
Status: Connected
Connection count: 1
Maximum Allowed Connections: 1
Authentication: None Specified
Header Digest: None Specified
Data Digest: None Specified
Configure Multiple Connected Session (MCS)
To add additional connections to a session or configure the MCS policy for a selected session, click MCS.
MCS...
More Information on iSCSI Sessions
OK
Cancel

FIGURE 7.26 [Properties] window

6. The [Source Portal] column in the [Multiple Connected Session (MCS)] window displays IP addresses. Check whether any IP address matches that recorded in step 2.
   If an IP address matches (192.168.3.150, in this example), this is the target connected to the device to be replaced.

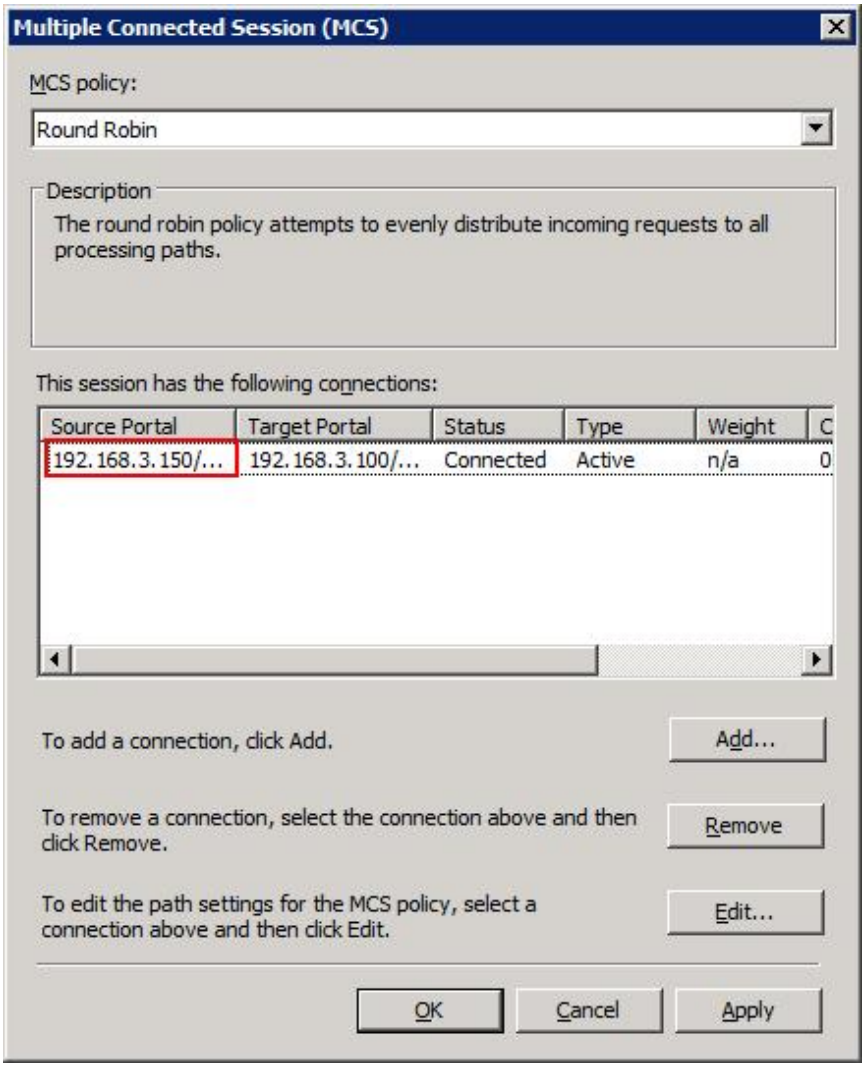


FIGURE 7.27 [Multiple Connected Session (MCS)] window

7. Click the [Cancel] button to return to [Properties] window shown in step 5, and click the [Cancel] button again to return to the [iSCSI Initiator Properties] window shown in step 4.

8. If no IP address in step 6 matches, select the next target, and repeat the steps after step 4.
   Otherwise, click the [Devices] button.

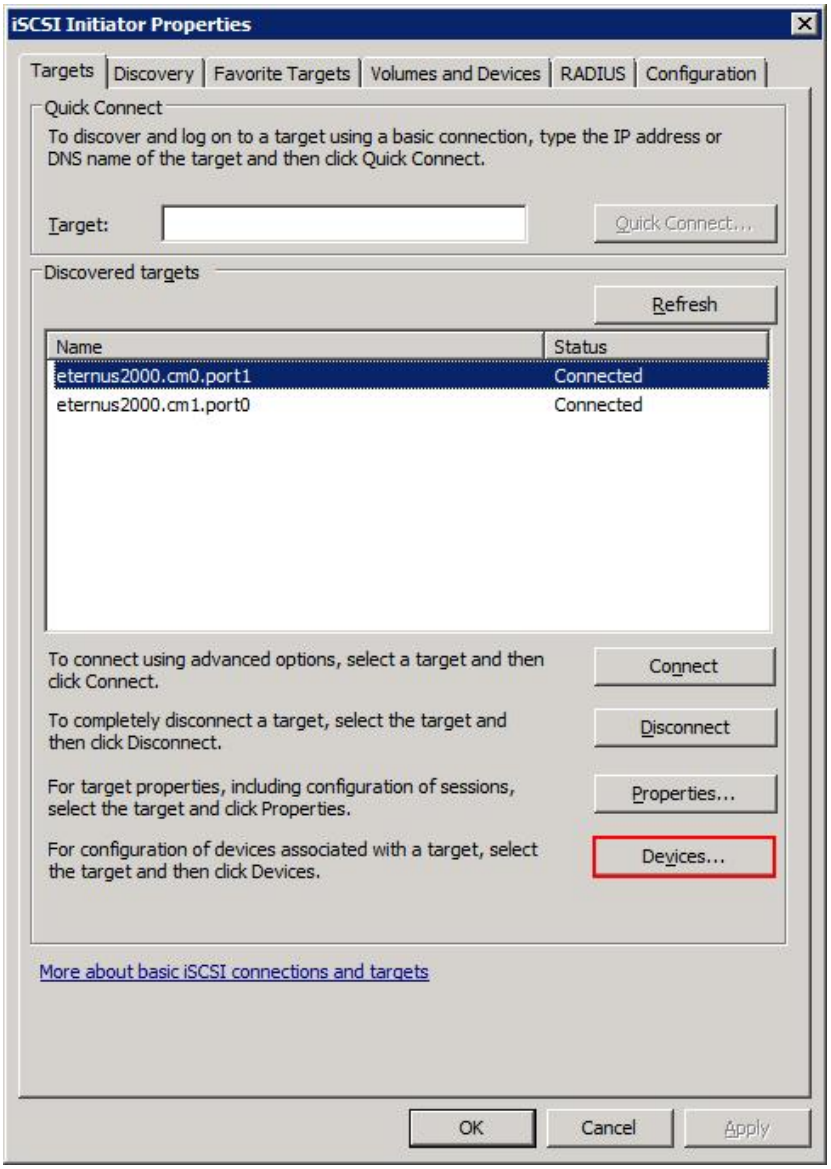


FIGURE 7.28 [iSCSI Initiator Properties] window (in Windows Server 2008 R2)

9. Record the values displayed in the [Address] column in the [Devices] window (Port 2: Bus 0: Target 0: LUN 0, in this example).

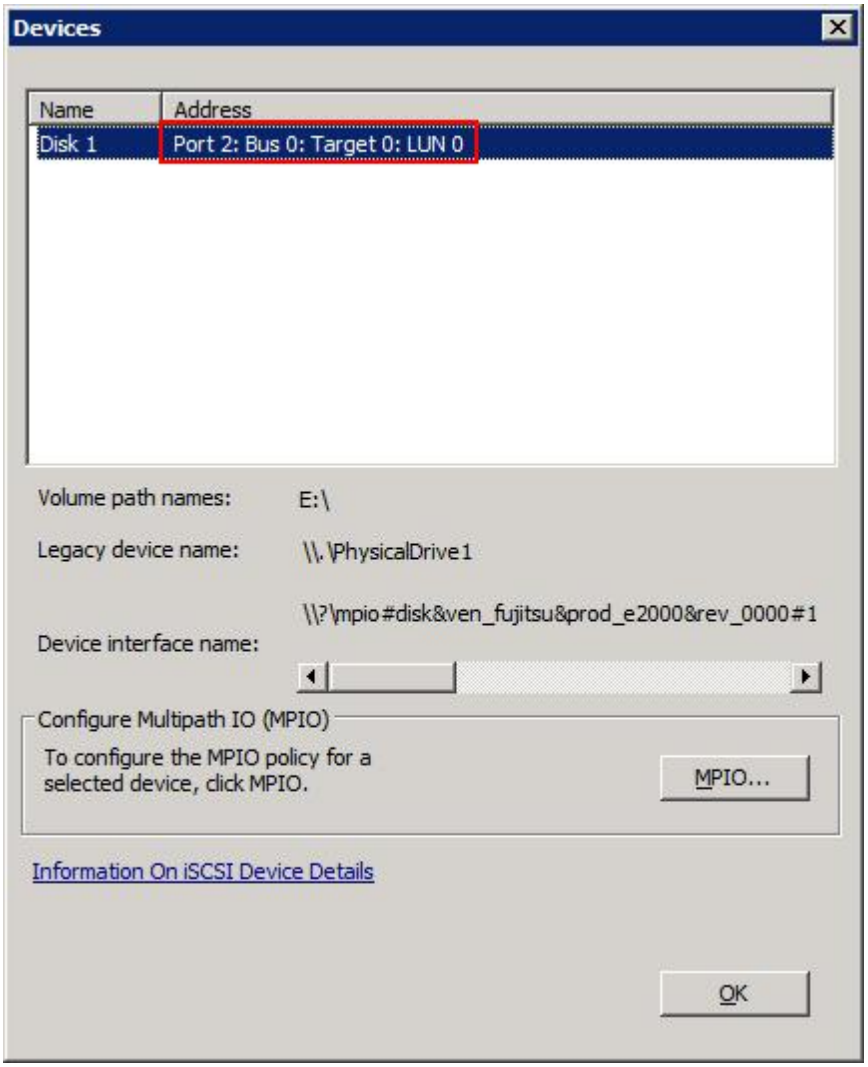


FIGURE 7.29 [Devices] window

7.5.2 Disconnecting MPD

This section describes the procedure for disconnecting MPD.

1. Start ETERNUS Multipath Manager.

2. Confirm the address value recorded in step 9 in 7.5.1 Confirming the incorporation of a card with MPD. Then, place the target device offline. For a multifunction card, it is necessary to place more than one device offline.

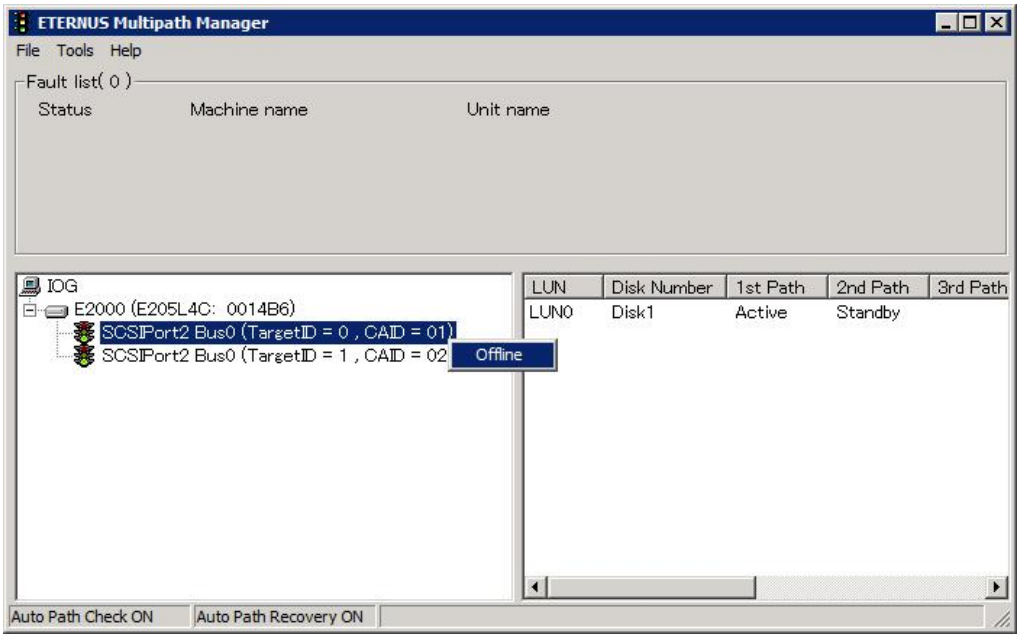


FIGURE 7.30 [ETERNUS Multipath Manager] window

3. Referring to 7.3 NIC Hot Plugging , replace the NIC.

   Remarks

   The error message "Source: FJSVpsa, ID: 25004" may be output to the event log during the replacement procedure. This message does not indicate any problem.

4. Set an IP address for the replacement device.
   Set the IP address and subnet mask recorded in step 2.

   Remarks

   If the following message appears when you set the IP address, select [Yes].

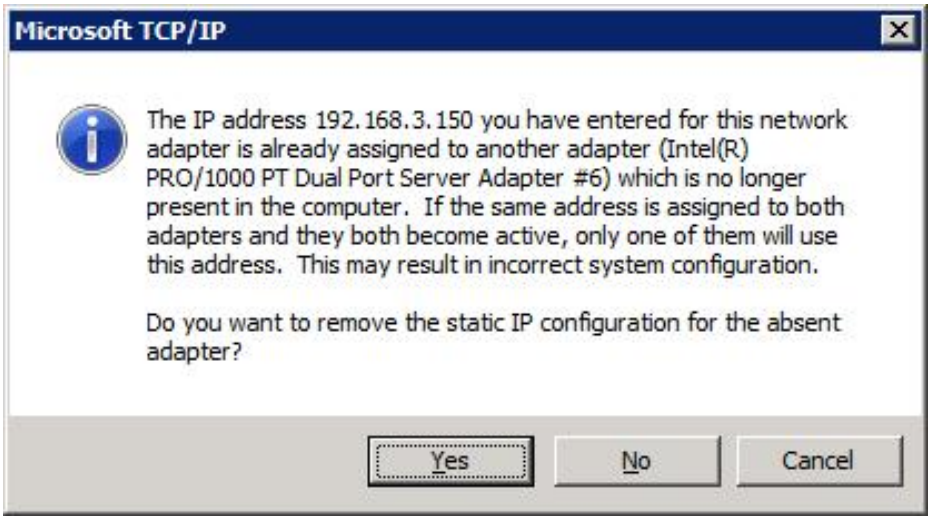

Microsoft TCP/IP
The IP address 192.168.3.150 you have entered for this network adapter is already assigned to another adapter (Intel(R) PRO/1000 PT Dual Port Server Adapter #6) which is no longer present in the computer. If the same address is assigned to both adapters and they both become active, only one of them will use this address. This may result in incorrect system configuration.
Do you want to remove the static IP configuration for the absent adapter?
Yes
No
Cancel

FIGURE 7.31 TCP/IP deletion message

5. Click the [Refresh] button on the [Targets] tab in the [iSCSI Initiator Properties] window. Confirm that the target status becomes [Connected].

Windows Server 2008

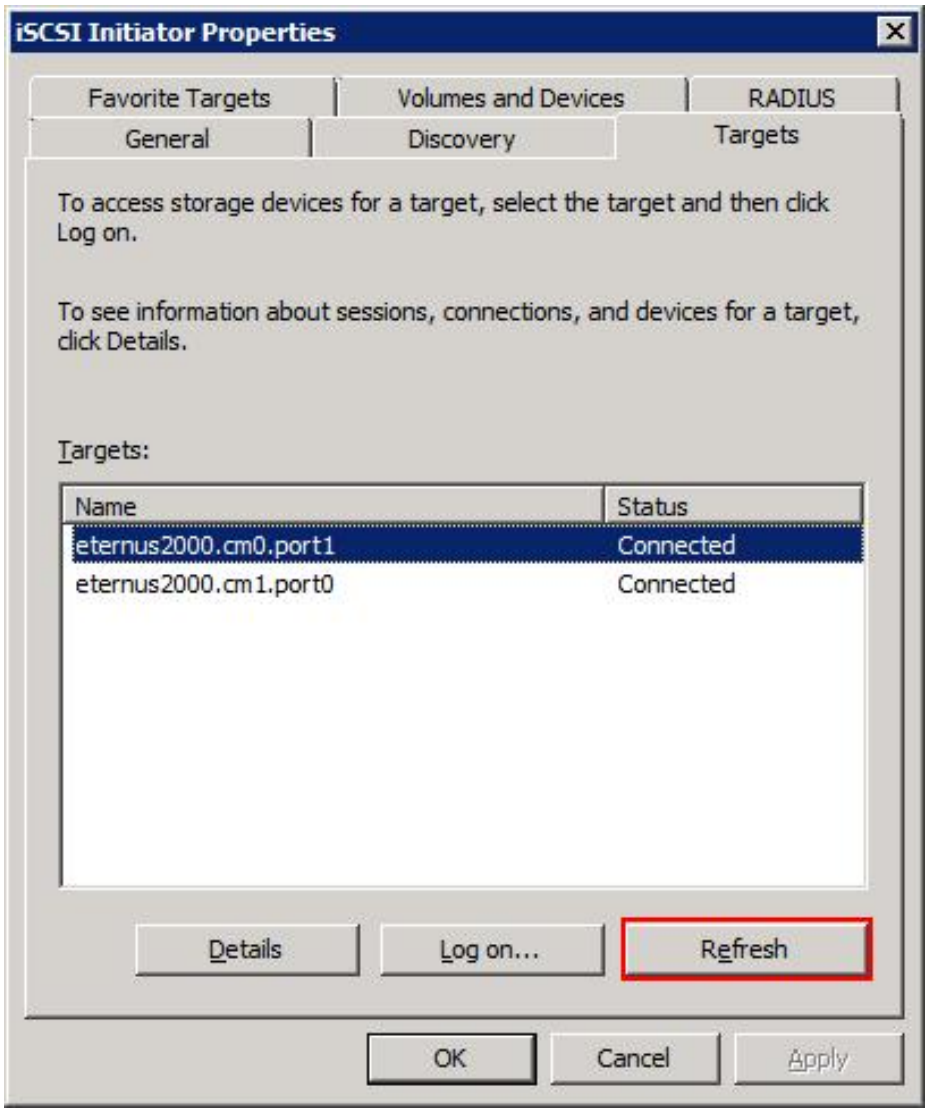


FIGURE 7.32 [iSCSI Initiator Properties] window (in Windows Server 2008)

Windows Server 2008 R2

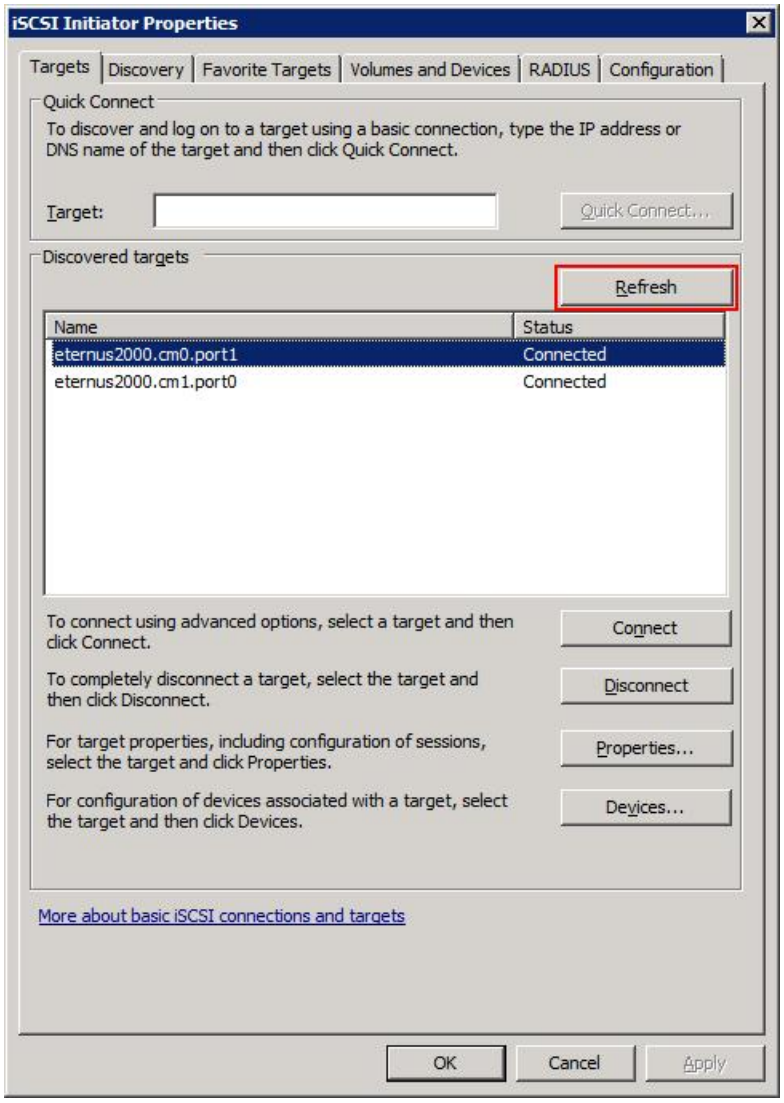


FIGURE 7.33 [iSCSI Initiator Properties] window (in Windows Server 2008 R2)

7.5.3 Incorporating a card with MPD

This section describes the procedure for incorporating a card with MPD.

1. Start ETERNUS Multipath Manager.

2. Place the replacement device online. For a multifunction card, place all the devices online.

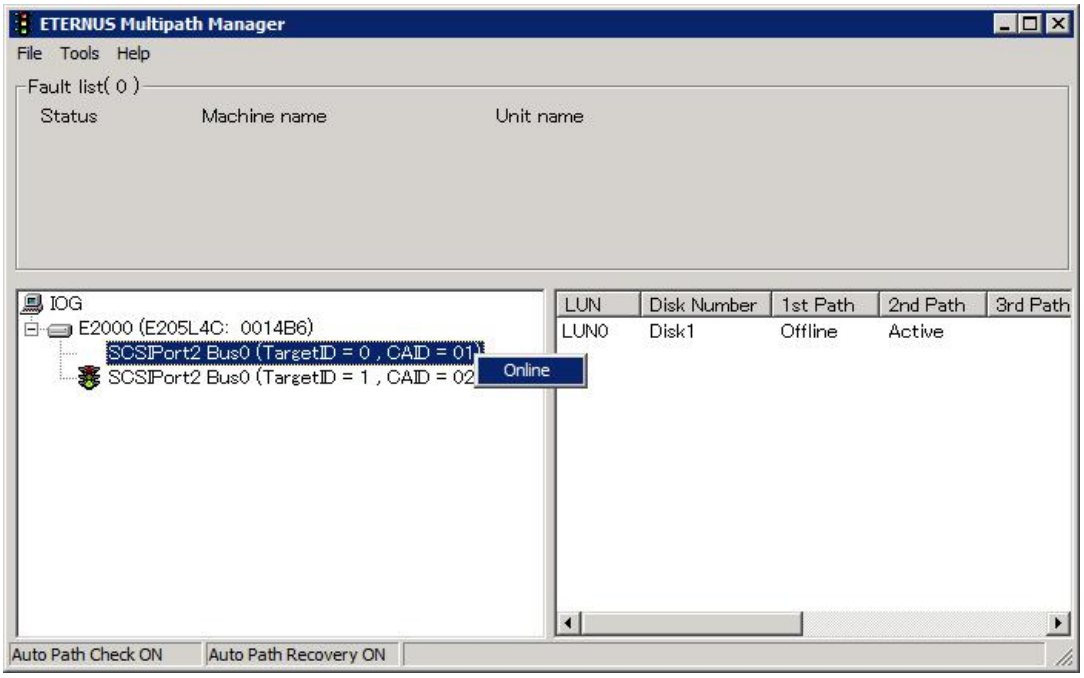


FIGURE 7.34 ETERNUS Multipath Manager

CHAPTER 8 Backup and Restore

This chapter describes the backup and restore operations required for restoring server data.

8.1 Backing Up and Restoring Configuration Information …. 218

8.1 Backing Up and Restoring Configuration Information

The PRIMEQUEST 1000 series has partitioning functions. These functions provide the user with partitions acting as independent servers. The user must configure the UEFI (Unified Extensible Firmware Interface) for each partition. The user can make these settings with operations on the MMB. The MMB has BIOS configuration information for each partition. It also has backup and restore functions for the configuration information on the MMB.

Notes

- Configuration information on the server must be backed up ahead of time. The backup enables restoration of the original information if the system becomes damaged or an operational error erases data on the server. Be sure to periodically back up server configuration information in case of such events.
- The PRIMEQUEST 1000 series server cannot be connected to an FDD (floppy disk) for backup, restore, or other such operations. To use an FDD, connect it to a remote PC or another server connected to the PRIMEQUEST 1000 series server.

This section describes the backup and restore operations for UEFI configuration information and MMB configuration information.
For details on the backup and restore windows, see Chapter 1 MMB Web-UI (Web User Interface) Operations in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

8.1.1 Backing up and restoring UEFI configuration information

Users can perform the following processes with the backup and restore functions for UEFI configuration information:

- Backing up all items that are set in the UEFI window
- Backing up the specified UEFI configuration information in a UEFI window for one partition from the MMB. This backup information can be applied to other partitions.
- Restoring backed-up UEFI configuration information during replacement of a faulty SB
- Restoring and copying the configuration information saved on a certain partition to another partition

A remote terminal can store the saved information. The data saved to the remote terminal can be restored.

From the [Backup BIOS Configuration] window of the MMB Web-UI, back up UEFI configuration information to the PC running your browser. The procedure is as follows.

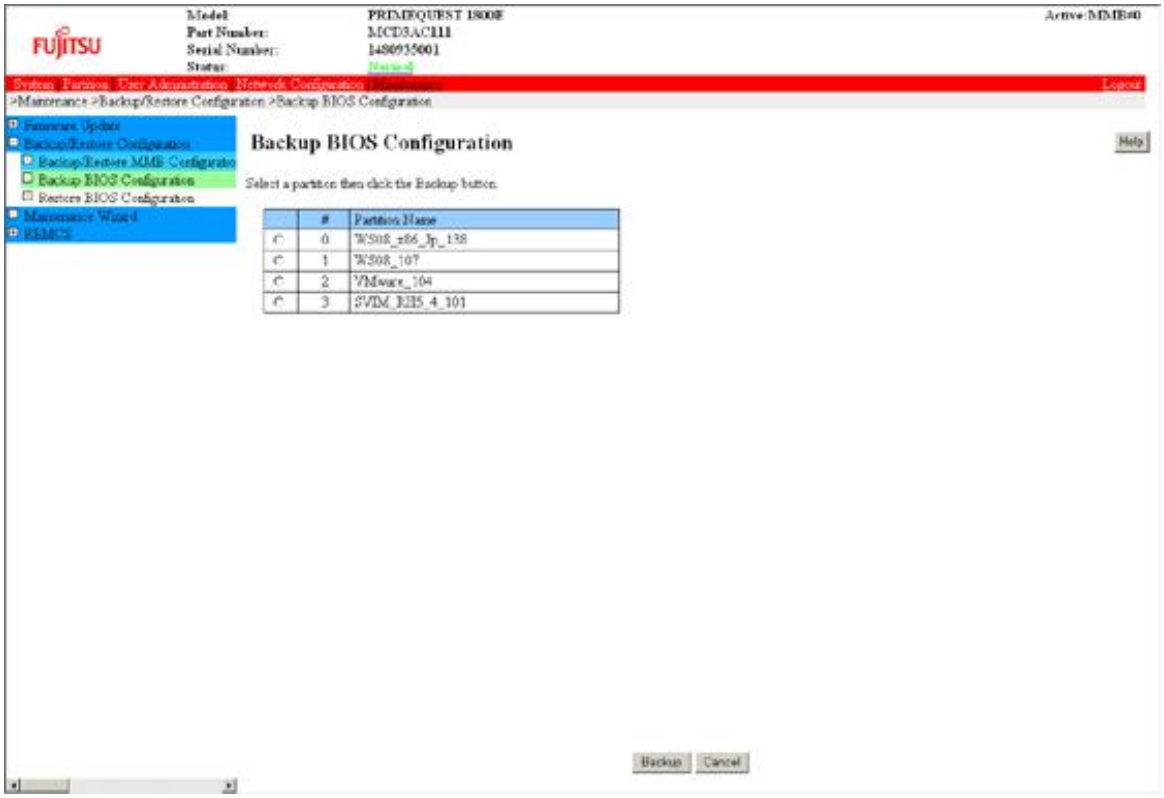


FIGURE 8.1 [Backup BIOS Configuration] window

Backing up UEFI configuration information

1. Select the radio button of the partition for which to back up the configuration information. Then, click the [Backup] button.
   The save destination dialog box of the browser appears.

2. Select the save destination path. Then, click the [OK] button.
   Download of the file begins.
   The default BIOS Configuration file name for the backup is as follows:
   Partition number_save date_BIOS version.dat

Restoring UEFI configuration information

From the [Restore BIOS Configuration] window, restore BIOS configuration information.

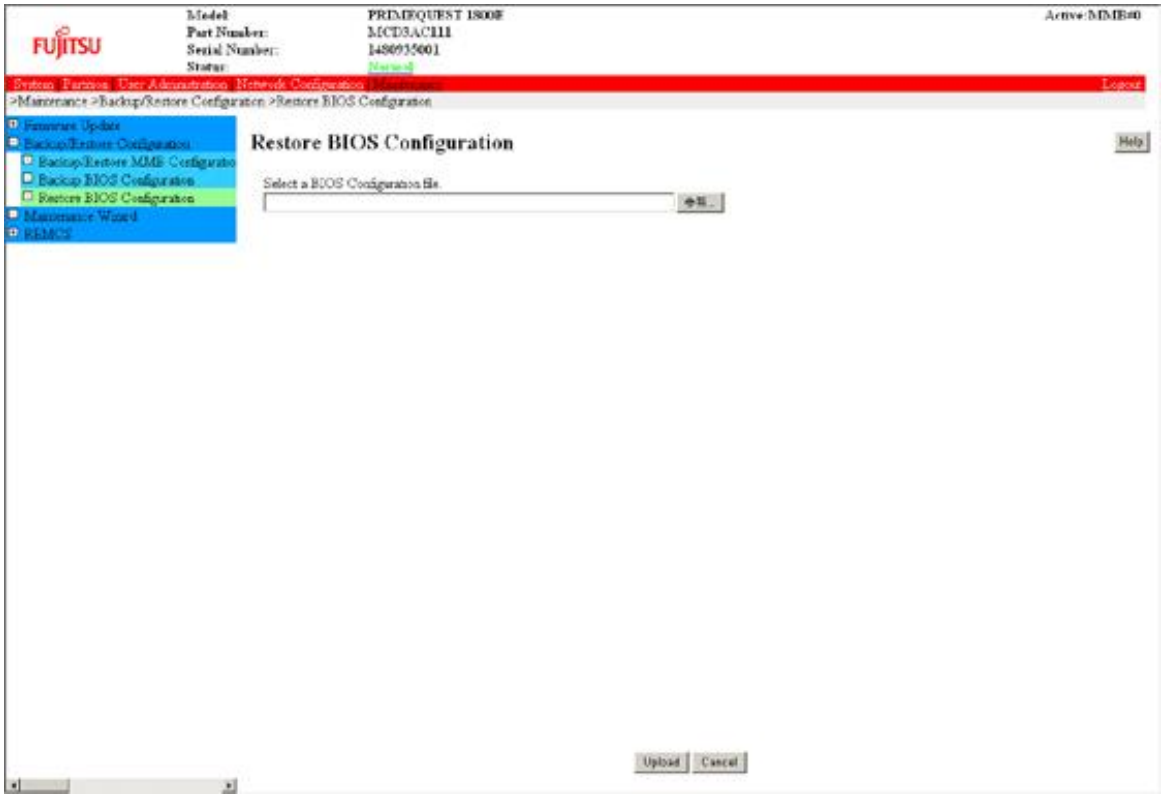


FIGURE 8.2 [Restore BIOS Configuration] window

1. Select the backup BIOS Configuration file stored on the remote PC. Then, click the [Upload] button.
   File transfer to the MMB begins.
   The following window appears when the file transfer is completed.

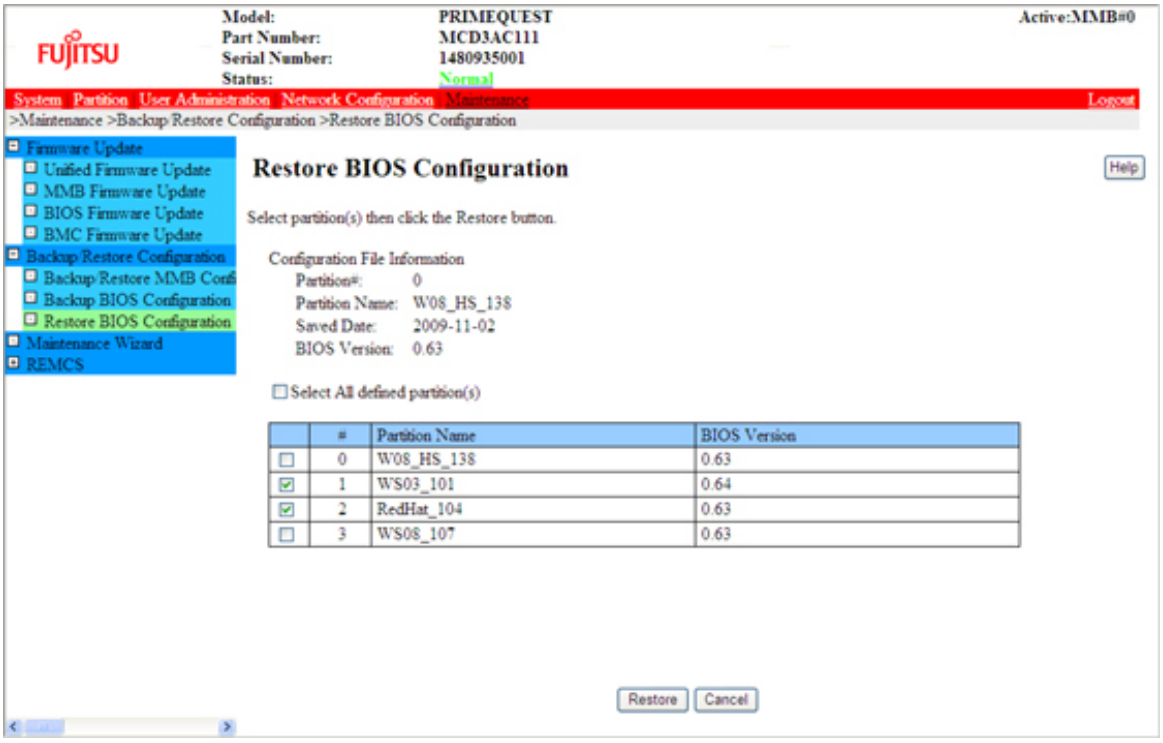


FIGURE 8.3 [Restore BIOS Configuration] window (partition selection)

2. Select the partition to restore. Then, click the [Restore] button.

8.1.2 Backing up and restoring MMB configuration information

From the Backup/Restore MMB Configuration window, you can back up and restore MMB configuration information. The procedure is as follows.

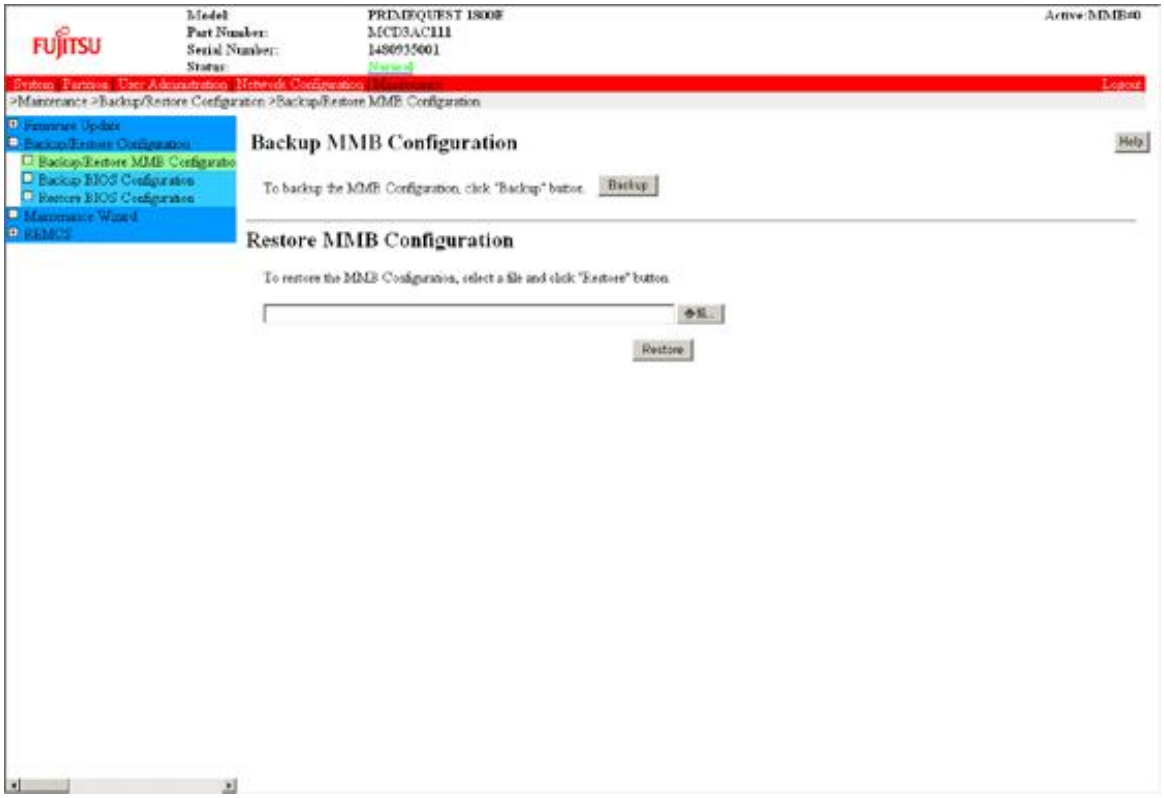


FIGURE 8.4 [Backup/Restore MMB Configuration] window

Backing up MMB configuration information

1. Click the [Backup] button.
   The browser dialog box for selecting the save destination appears.

2. Select the save destination path. Then, click the [OK] button.
   Download of the file begins. The default MMB Configuration file name for the backup is as follows:
   MMB_(*save date*)_(*MMB version*).dat

Restoring MMB configuration information

1. Confirm that the system has stopped completely.

2. Select the backup MMB Configuration file stored on the Remote PC. Then, click the [Restore] button.
   File transfer to the MMB begins. A restore confirmation dialog box appears when the file transfer is completed.

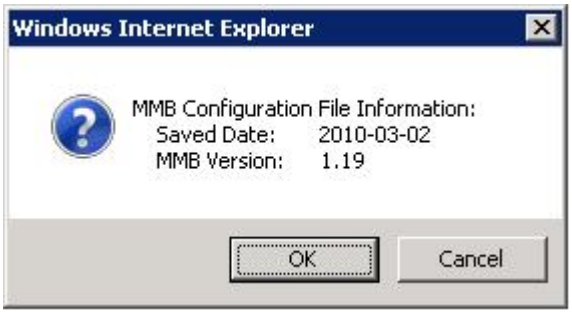


FIGURE 8.5 Restore confirmation dialog box

3. To restore MMB configuration information, click the [OK] button. To cancel restoration, click the [Cancel] button.

8.1.3 Saving PSA management information

For details on how to save PSA management information, see 6.8.1 Saving PSA management information in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

Remarks

This function is provided only with the PRIMEQUEST 1800E.

CHAPTER 9 System Startup, Shutdown, and Power Control

This chapter describes how to start and shut down the PRIMEQUEST 1000 series server, and control the system power.

9.1 Powering On/Off the Whole System 224
9.2 Powering On and Off Partitions 225
9.3 Scheduled Operations 232
9.4 Automatic Partition Restart Conditions 235
9.5 Power Failure and Power Recovery 237
9.6 Remote Shutdown (Windows) 238

9.1 Powering On/Off the Whole System

This chapter describes the power-on and power-off controls supported by the system.

The power supply to the whole system is controlled from the [System Power Control] window of the MMB.

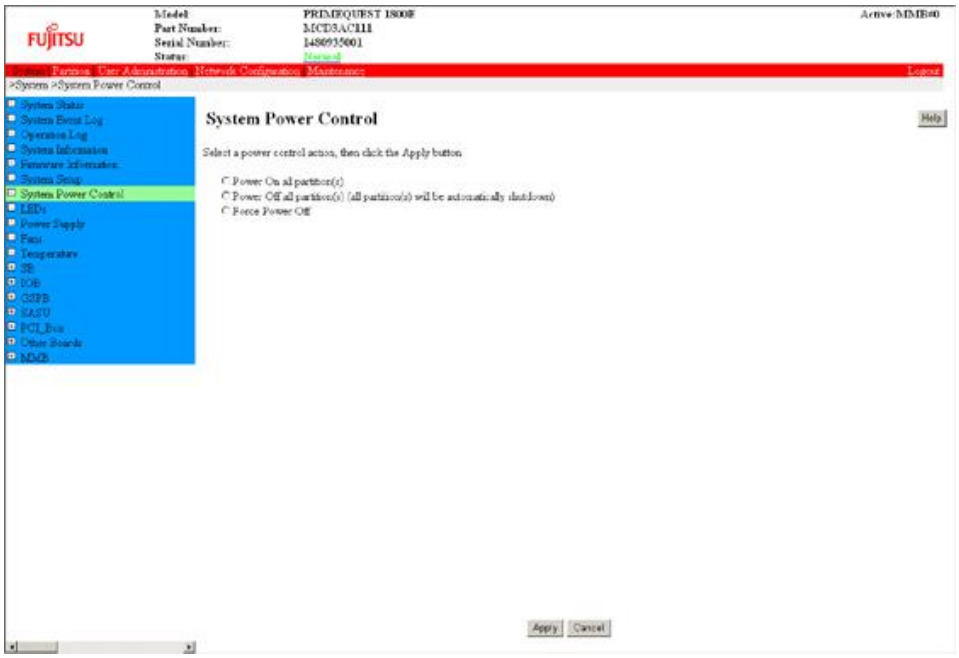


FIGURE 9.1 [System Power Control] window

For details on the [System Power Control] window, see 1.2.8 [System Power Control] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

9.2 Powering On and Off Partitions

This section describes the types of and methods for powering on and off partitions, and how to check the partition power status.

9.2.1 Powering on a partition

The three partition power-on methods are as follows.

1. Partition power-on through MMB Web-UI or MMB CLI operations
   You can power on a partition by operating the MMB Web-UI or MMB CLI. In this method, you can specify power-on of all partitions or power-on in units of partitions.

2. Scheduled operations (automatic operations according to set schedules)
   You can power on partitions by a scheduled operation (automatic operation function). Registering the power-on time in advance by using the scheduled operation function enables automatic power-on in units of partitions.

3. Wake On LAN (WOL)
   You can power on a partition with WOL. In this method (power-on with WOL), you can specify power-on of each relevant partition containing the GSPB.

Notes

- After AC power-off (device stop), the WOL configuration returns to the initial status. Here, to restore the WOL configuration, start the OS.
- Make the setting for enabling/disabling WOL from the operating system.
  To enable WOL in Windows, you need to make the following setting for all device manager ports.
  Click [Device Manager] - [Network adapters] - [INTEL(R)82576Gigabit Dual Port Network Connection] - [Properties] - [Power Management], and then check the [Wake On Magic Packet from power off state] check box.
  To make the setting in Windows, the supplied "Intel PROSet" driver needs to have been installed.

9.2.2 Partition power-on unit

The possible power-on units depend on how a partition is powered on, as shown below. For details on operation permissions (i.e., privileges) for the partition power-on operation, see 1.1 Web-UI Menus in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

TABLE 9.1 Power-on method and unit

Power-on method	Power-on unit: All partitions	Power-on unit: Single partition	Remarks
MMB Web-UI, MMB CLI	Possible	Possible	
Scheduled operation	Not possible	Possible	Automatic operation

Power-on method	Power-on unit: All partitions	Power-on unit: Single partition	Remarks
Wake On LAN (WOL)	Not possible	Possible	Relevant partition units containing the GSPB

9.2.3 Powering off a partition

The three partition power-off methods are as follows:

1. Shutdown from the operating system (recommended)
   Shut down the operating system by using an operating system command or other means. Usually, to power off a partition, shut it down from the operating system. For details on operating system shutdown commands and other information, see the respective operating system manuals.

2. Partition power-off through [MMB Web-UI] window or MMB CLI operations
   In this method, you can power off a partition by operating the Web window of an external terminal or the MMB CLI. These methods enable power-off of all partitions or power-off in units of partitions.

3. Powering off a partition by a scheduled operation
   You can power off partitions by a scheduled operation (automatic operation function). Registering the power-off time in advance by using the scheduled operation function enables automatic power-off in units of partitions.

9.2.4 Partition power-off unit

The possible power-off units depend on how a partition is powered off, as shown below. For details on operation permissions (i.e., privileges) for the partition power-off operation, see 1.1 Web-UI Menus in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

TABLE 9.2 Power-off methods and units

Power-off method	Power-off unit: All partitions	Power-off unit: Single partition	Remarks
MMB Web-UI, MMB CLI	Possible	Possible	
Scheduled operation	Not possible	Possible	Automatic operation

Note

In the following cases, confirm the details according to 11.2 Troubleshooting. If the error recurs, contact your sales representative or a field engineer.
Before making contact, confirm the model name and serial number shown on the label affixed to the main unit.
Until the problem is solved, do not execute [Reset] or [Force Power Off] on the partition.

- When [Power Off], [Reset], or [Force Power Off] is executed on the partition or when the partition is shut down from the operating system, [Status] on the MMB Web-UI (information area) changes to "Error."
- The MMB Web-UI displays "Read Error" in [Part Number] and [Serial Number] for the status of a component.

9.2.5 Partition power-on and power-off procedures

The procedures include those for single partition power-on/off and those for multiple partition power-on/off. The single-partition power-on/off operation is the same as the multiple-partition power-on/off operation. When powering off multiple partitions that share one external device, first power off the multiple partitions and then the external device.
The following table lists power-on/off permissions.

TABLE 9.3 Power-on/off permissions

User privilege	Power-on/off permission
Administrator	Has permission for all partitions.
Operator	Has permission for all partitions.
Partition Operator	Has permission for only the partition authorized for the user.
User	Does not have permission for any partition.
CE	Does not have permission for any partition.

For details on the user privileges for the MMB Web-UI menus, see 1.1 Web-UI Menus in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

9.2.6 Powering on a partition by using the MMB

This section describes the partition power-on procedure using the MMB.

1. Log in to the MMB Web-UI.
   The [MMB Web-UI] window appears.

2. Click [Partition] - [Power Control].
   The [Power Control] window appears. This window displays only partitions having an SB, IOB, or GSPB.

FIGURE 9.2 [Power Control] window

The [#] column has partition numbers.

For details on the [Power Control] window, see 1.3.1 [Power Control] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

3. Select [Power On] in [Power Control] for the partition that you are going to power on. Then, click the [Apply] button.
   A confirmation dialog box appears.

4. Click the [OK] button to power on the partition or the [Cancel] button to cancel partition power-on.

Remarks

If the power to the partition is already on, or if the specified control fails because the power is currently off, a warning message appears.

For details on the display and setting items in the [Power Control] window, see 1.3.1 [Power Control] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

9.2.7 Controlling partition startup by using the MMB

Only users with Administrators or Operator privileges can set partition boot control. This section describes the partition startup control procedure using the MMB.

1. Click [Partition] - [Power Control].
   The [Power Control] window appears.

FIGURE 9.3 [Power Control] window

For details on the contents and setting items of the [Power Control] window, see 1.3.1 [Power Control] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

9.2.8 Checking the partition power status by using the MMB

This section describes how to check the partition power status.

1. Log in to the MMB Web-UI.
   The [MMB Web-UI] window appears.

2. From the Web-UI menu, click [Partition] - [Partition#x] - [Information].
   The [Information] window appears.

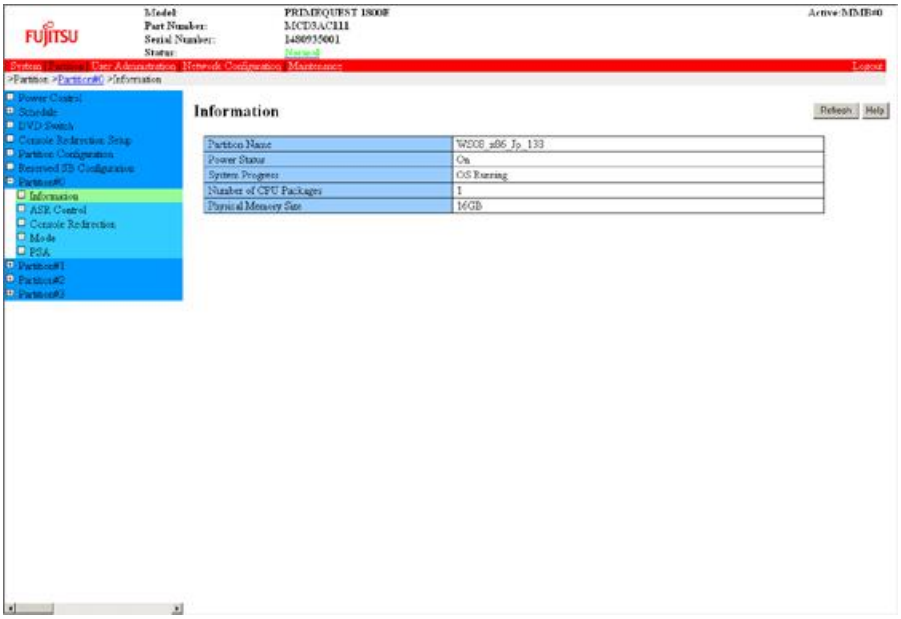


FIGURE 9.4 [Information] window

[Power Status] displays the partition power status.

For details on the contents and setting items of the [Information] window, see 1.3.7 [Partition#x] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

9.2.9 Powering off a partition by using the MMB

This section describes the power-off procedure using the [MMB Web-UI] window.

1. Log in to the MMB Web-UI.
   The [MMB Web-UI] window appears.

2. From the Web-UI menu, click [Partition] - [Power Control].
   The [Power Control] window appears.

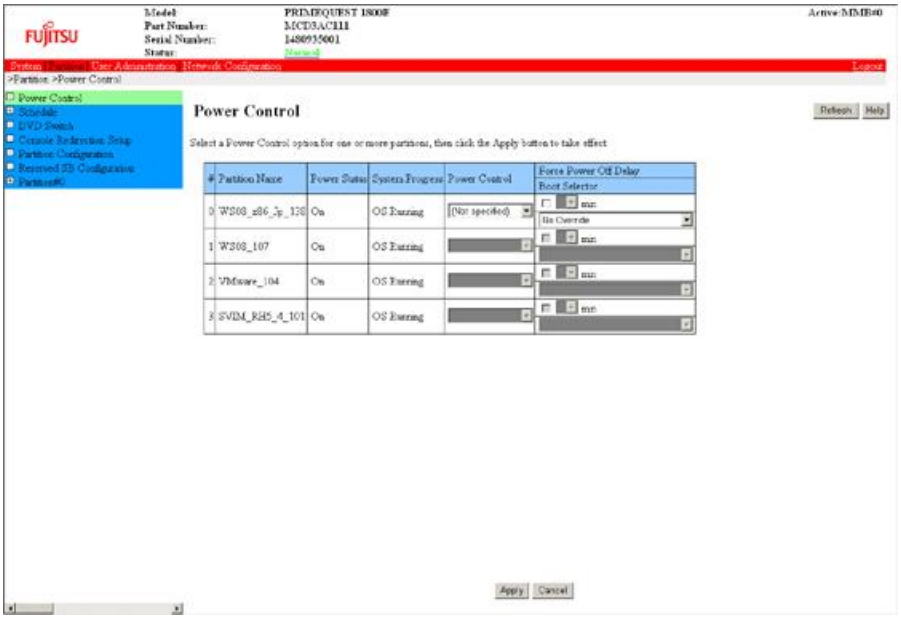


FIGURE 9.5 [Power Control] window

The [#] column has partition numbers.

For details on the [Power Control] window, see 1.3.1 [Power Control] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

3. Select [Power Off] in [Power Control] for the partition that you are going to power off. Then, click the [Apply] button.
   The specified partition is powered off.

Remarks

Windows shutdown from the MMB Web-UI requires ServerView Agent.

For details on how to set ServerView Agent, contact the distributor where you purchased your product or your sales representative.

9.3 Scheduled Operations

This section describes scheduled operations.

9.3.1 Powering on a partition by a scheduled operation

Setting scheduled operations for a partition will turn on the power to the partition at a set time.
A daily, weekly, or monthly schedule can be set, or a schedule can be set for a specific day.

Note

The times recorded in the SEL may lag behind the scheduled operation times as described below.

1. After a configuration check and preparation for startup, the power-on sequence may take a while to start. In such cases, the displayed SEL times may be six to eight seconds later than the scheduled operation times.
2. The shutdown instruction from the MMB to the operating system is executed within a few seconds after the set time. However, the following times may vary depending on the setting, configuration, etc.:
   - The time that the instruction from the MMB takes to reach the operating system
   - The time from the start of the operating system shutdown to MMB notification of the shutdown start in the SEL
3. Even if the [Power on Delay] setting is 0 seconds, the period from the start of the power-on sequence to a reset may still range from 30 to 70 seconds.

For details on schedule settings, see 1.3.2 [Schedule] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

9.3.2 Powering off a partition by a scheduled operation

Setting scheduled operations for a partition will turn off the power to the partition at a set time.
A daily, weekly, or monthly schedule can be set, or a schedule can be set for a specific day.

For details on schedule settings, see 1.3.2 [Schedule] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

9.3.3 Relationship between scheduled operations and the power recovery function

In the PRIMEQUEST 1000 series, scheduled operations and the power recovery function operate jointly when power recovery mode is set to "Schedule Sync."

TABLE 9.4 Relationship between scheduled operations and power recovery mode

No.	Power failure time	Power recovery time	Always Off (*)	Always On (*)	Restore (*)	Schedule Sync (*)
1	Outside working hours	During working hours	OFF	ON	OFF	ON

No.	Power failure time	Power recovery time	Always Off (*)	Always On (*)	Restore (*)	Schedule Sync (*)
2	During working hours	During working hours	OFF	ON	ON	ON
3	Outside working hours	Outside working hours	OFF	ON	OFF	OFF
4	During working hours	Outside working hours	OFF	ON	ON	OFF

ON: Partition power on; OFF: Partition power off

Note

Operations indicated by an asterisk (*) in the table assume normal shutdown when a power failure occurs. If an abnormal power-off occurs because no UPS is used, the partition will not be automatically started (= OFF mode operation) irrespective of the power recovery operation settings.

9.3.4 Scheduled operation support conditions

TABLE 9.5 Power on/off lists power on/off items, scheduled operation support conditions, and menu items.

TABLE 9.5 Power on/off

Menu item	Scheduled operation	Description
All Partition Power On	Not supported	Powers on all partitions.
All Partition Power Off	Not supported	Powers off all the partitions that are powered on, through an operating system shutdown.
Partition Power On	Supported	Powers on any partition.
Partition Power Off	Supported	Powers off any partition through an operating system shutdown.
Partition Force Power Off	Not supported	Forcibly powers off any partition, without an operating system shutdown. Use this item to forcibly power off a partition when shutdown from the operating system is disabled.
Power Cycle	Not supported	Powers off and on any partition. The partition is forcibly powered off without an operating system shutdown.
Reset	Not supported	Resets any partition. This reset does not involve an operating system reboot.
NMI	Not supported	Issues an NMI interrupt to any partition.

For details on scheduled operation settings, see 1.3.2 [Schedule] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

For details on how to set Windows Server 2008/Windows Server 2012 to shut down, see APPENDIX I Windows Shutdown Settings.

9.4 Automatic Partition Restart Conditions

This section describes how to set automatic partition restart conditions.

9.4.1 Setting automatic partition restart conditions

Only users with Administrators privileges can set automatic partition restart conditions.

Note

- Set Boot Watchdog to [Disable] for the following operations:
  - CD-ROM boot
  - Operation system installation
  - Boot in single-user mode
  - Backup or restore with SystemcastWizard Professional

  With [Enable] set for Boot Watchdog, the above operations will try to restart the operating system for the specified number of times before performing the specified action (Stop rebooting and Power Off, Stop rebooting, or Diagnostic Interrupt assert). The number of retries and the action taken depend on the settings in the [ASR (Automatic Server Restart) Control] window of the MMB.

  In the [ASR (Automatic Server Restart) Control] window, you can forcibly set Boot Watchdog to [Disable] by checking [Cancel Boot Watchdog] and clicking the [Apply] button.

Set automatic partition restart conditions by using the following procedure.

1. Click [Partition] - [Partition#x] - [ASR Control].
   The [ASR Control] window appears.

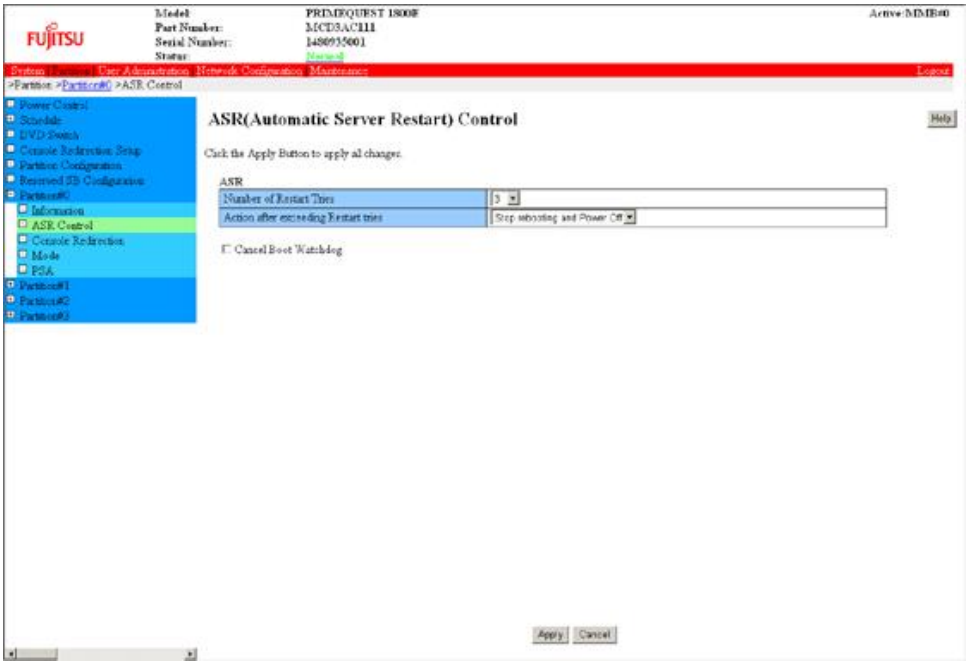


FIGURE 9.6 [ASR (Automatic Server Restart) Control] window

2. Set automatic partition restart conditions.

The following lists the setting items in the [ASR Control] window.

TABLE 9.6 Display and setting items in the [ASR Control] window

Display/Setting item	Description
Number of Restart Tries	Sets the number of OS restart retries when a Boot Watchdog or PSA Software Watchdog time-out occurs. You can set 0 to 10 times. If 0 is specified, OS restart is not retried. The default is 5 times.
Action after exceeding Restart Tries	Specifies the action taken if the number of OS restart attempts for a Watchdog time-out exceeds the aforementioned number of retries. Set any of the following items as Action: - Stop rebooting and Power Off: Stop the reboot process and power off the partition. - Stop rebooting: Stop the reboot process and stop the partition. - Diagnostic Interrupt assert: Stop the reboot process and issue instruction to implement NMI interrupt for the partition. Attempt to collect data for investigation (dump) for the stopped partition to investigate the cause of the stoppage. The default is Stop rebooting and Power Off.
Automatic Power On Delay	Specifies the delay time that lasts until Power On is executed in an automatic restart. You can specify 0 to 10 minutes. The default is 0 minutes.
Cancel Boot Watchdog	Cancels OS Boot Watchdog.

3. To cancel the Boot Watchdog function, check the [Cancel Boot Watchdog] check box.

4. Click the [Apply] button.
   Even after you have checked the [Cancel Boot Watchdog] check box, the check box is unchecked but the cancellation is processed.

For details on how to operate the [ASR Control] window, see 1.3.7 [Partition#x] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

9.5 Power Failure and Power Recovery

In the PRIMEQUEST 1000 series server, you can set the system operations during a power failure and power recovery in units of cabinets.
Make these settings from the MMB Web-UI.

9.5.1 Settings in case of power failure

For use together with a UPS, you can instruct the partitions that are powered on to shut down after the detection of a power failure. For that instruction, you can set Shutdown Delay after UPS detects AC Failure (0 to 9999 seconds).

9.5.2 Settings for power recovery

For use together with a UPS, you can make the following settings for the power recovery detected after a power failure. The default is "Restore."

TABLE 9.7 Power recovery policy

Item	System operation
Always Off	Continues the power-off status after a power recovery.
Always On	Powers on the partition after a power recovery irrespective of the power failure status.
Restore	Returns to the state at the power failure occurrence time. This powers on the partitions that were on when the power failure occurred. It keeps the power-off status for the partitions that were off when the power failure occurred.
Schedule Sync	Automatically powers on the partition if the power failure occurred during working hours according to the partition time and scheduled operation settings.(*)

* For details on scheduled operations, see 9.3 Scheduled Operations.

If startup of an external SAN unit connected to the UPS or other such unit is slow during power recovery, the SAN unit does not become usable even if the PRIMEQUEST 1000 series server powers on the partition. For this reason, SAN boot may fail. In this case, you can set "Partition Power On Delay" (in units of seconds: 0 to 9999; default = 0) in addition to the above settings.

For details on how to set system operations for a power failure occurrence or power recovery, see 1.2.7 [System Setup] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

9.6 Remote Shutdown (Windows)

Windows (Windows XP and later) comes with a shutdown.exe command. You can perform remote shutdown from a management terminal by using this command.

9.6.1 Prerequisites for remote shutdown

The prerequisites for using remote shutdown (Windows) are as follows.

- The OS of the management terminal is one of the following.
  - Windows XP
  - Windows Vista
  - Windows Server 2003
  - Windows Server 2003 R2
  - Windows Server 2008
  - Windows Server 2008 R2
  - Windows 7
  - Windows Server 2012
  - Windows 8
- The Windows to be shut down by a management terminal must be connected to a network.
- Firewall settings of the target Windows system
  - In the [Exception] setting of the firewall, [File and Printer Sharing] must be checked.
- If the target Windows system is in the workgroup environment
  - The user name and password of the management terminal must match those of the target Windows system.
- If the target Windows system is in the Active Directory environment
  - A user with Administrator privileges for the target Windows system must log in to the management terminal.

9.6.2 How to use remote shutdown

To perform a remote shutdown, log in to the management terminal and enter the shutdown command.

```
shutdown -s -m \\<Server Name>
```

In <Server Name>, specify the computer name of the target Windows system.
For details on other options of the shutdown command, see the help for the command.
Executing the shutdown command with the /? option displays the simplified help.

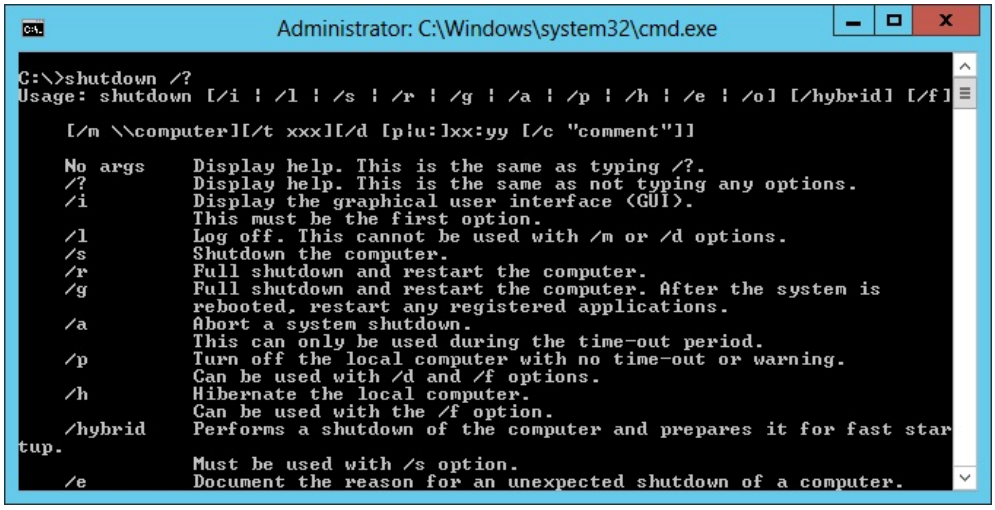

Administrator: C:\Windows\system32\cmd.exe
C:\>shutdown /?
Usage: shutdown [/i | /l | /s | /r | /g | /a | /p | /h | /e | /o] [/hybrid] [/f]
[/m \\computer][/t xxx][/d [p|u:]xx:yy [/c "comment"]]
No args Display help. This is the same as typing /?.
/? Display help. This is the same as not typing any options.
/i Display the graphical user interface (GUI).
This must be the first option.
/l Log off. This cannot be used with /m or /d options.
/s Shutdown the computer.
/r Full shutdown and restart the computer.
/g Full shutdown and restart the computer. After the system is
rebooted, restart any registered applications.
/a Abort a system shutdown.
This can only be used during the time-out period.
/p Turn off the local computer with no time-out or warning.
Can be used with /d and /f options.
/h Hibernate the local computer.
Can be used with the /f option.
/hybrid Performs a shutdown of the computer and prepares it for fast star
tup.
Must be used with /s option.
/e Document the reason for an unexpected shutdown of a computer.

FIGURE 9.7 Simplified help for the shutdown command

CHAPTER 10 Configuration and Status Checking (Contents, Methods, and Procedures)

This chapter describes functions for checking the configuration and status of the PRIMEQUEST 1000 series server. The functions are broken down by firmware (or other software) and by tool.

10.1 MMB Web-UI 242
10.2 MMB CLI 245
10.3 PSA Web-UI 246
10.4 PSA CLI 247
10.5 UEFI 248
10.6 ServerView Suite 249

10.1 MMB Web-UI

The PRIMEQUEST 1000 series unifies PSA and SB management via the MMB Web-UI. The following lists the functions provided by the MMB Web-UI.
For details on the functions in TABLE 10.1 Functions provided by the MMB Web-UI, see the reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).
The PSA windows in the MMB Web-UI are provided only with the PRIMEQUEST 1800E.

TABLE 10.1 Functions provided by the MMB Web-UI

Function	Reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN)
Displays the status of the whole system.	1.2.1 [System Status] window
Displays the events stored in the SEL (System Event Log) of the MMB.	1.2.2 [System Event Log] window
Displays logs related to Web-UI and CLI settings and operations.	1.2.3 [Operation Log] window
Displays hardware problem information (REMCS notification target message). Displays this message on the PRIMEQUEST 1800E2.	1.2.4 [Partition Event Log] window
Displays information related to the PRIMEQUEST 1000 series system. Sets the name of the PRIMEQUEST 1000 series system (cabinet). Sets an Asset Tag (asset management number).	1.2.5 [System Information] window
Displays a firmware version.	1.2.6 [Firmware Information] window
Sets a system configuration.	1.2.7 [System Setup] window
Controls the system power.	1.2.8 [System Power Control] window
Displays the LED status.	1.2.9 [LEDs] window
Displays the PSU status. Displays the action taken in response to a PSU failure.	1.2.10 [Power Supply] window
Displays the fan status. Displays the reaction response to a fan failure.	1.2.11 [Fans] window
Displays the temperature of the temperature sensor in the system. Displays the reaction response to a temperature error.	1.2.12 [Temperature] window
Displays and sets the SB#x board.	1.2.13 [SB] menu
Displays and sets the IOB#x board.	1.2.14 [IOB] menu
Displays and sets the GSPB#x board.	1.2.15 [GSPB] menu
Displays and sets the status of SAS disk unit #x.	1.2.16 [SASU] menu

Function	Reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN)
Displays the status of the PCI_Box connected to the system.	1.2.17 [PCI_Box] menu
Displays the DVDB (DVD board) status.	1.2.18 [Other Boards] menu
Displays information related to the MMB.	1.2.19 [MMB] menu
Controls the partition power supply.	1.3.1 [Power Control] window
Sets a schedule for each partition.	1.3.2 [Schedule] menu
Sets which partition to connect to the DVD.	1.3.3 [DVD Switch] window
Sets the SB, IOB, and GSPB that configure a partition.	1.3.4 [Partition Configuration] window
Sets a Reserved SB.	1.3.5 [Reserved SB Configuration] window
Sets video redirection, text console redirection, and remote storage.	1.3.6 [Console Redirection Setup] window
Displays the partition status and various information related to the partition.	1.3.7 [Partition#x] menu
Sets conditions for automatically restarting the partition (ASR (Automatic Server Restart) Control).	1.3.7 [Partition#x] menu
Starts video redirection and text console redirection.	1.3.7 [Partition#x] menu
Sets various modes for the partition.	1.3.7 [Partition#x] menu
Displays information on the currently registered user account.	1.4.1 [User List] window
Changes the password of the currently logged-in user.	1.4.2 [Change Password] window
Displays a list of users connected to the MMB via Serial, Telnet/SSH, and Web-UI.	1.4.3 [Who] window
Sets the MMB date and time.	1.5.1 [Date/Time] window
Sets the IP address and other values for MMB access.	1.5.2 [Network Interface] window
Sets Speed/Duplex of each port on the MMB board.	1.5.3 [Management LAN Port Configuration] window
Sets the network protocol of the MMB.	1.5.4 [Network Protocols] window
Configures automatic update for Web-UI windows whose status changes.	1.5.5 [Refresh Rate] window
Makes settings related to SNMP.	1.5.6 [SNMP Configuration] menu
Sets an SNMP trap destination.	1.5.6 [SNMP Configuration] menu
Sets the Engine ID and makes user settings specific to SNMP v3.	1.5.6 [SNMP Configuration] menu
Creates a secret key and the corresponding CSR (signature request).	1.5.7 [SSL] menu

Function	Reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN)
Retrieves the secret key or CSR (signature request) stored on the MMB.	1.5.7 [SSL] menu
Imports the signed electronic certificate sent from the certificate authority to the MMB.	1.5.7 [SSL] menu
Creates a self-signed certificate.	1.5.7 [SSL] menu
Creates a private key for the SSH server.	1.5.8 [SSH] menu
Makes the user settings required for control of the MMB via RMCP from the remote server.	1.5.9 [Remote Server Management] window
Operates access control for network protocols.	1.5.10 [Access Control] window
Sets e-mail notification for when an event occurs.	1.5.11 [Alarm E-Mail] window
Executes the batch firmware update process.	1.6.1 [Firmware Update] menu
Backs up and restores MMB/UEFI configuration information.	1.6.2 [Backup/Restore Configuration] menu
Provides support in the form of a wizard for device maintenance.	1.6.3 [Maintenance Wizard] window
Operates REMCS and makes settings related to REMCS.	1.6.4 REMCS menu

10.2 MMB CLI

You can access the MMB CLI via the MMB serial port or the management LAN. The commands that you can use from the MMB CLI include those for display and settings.
For details on MMB command lines, see Chapter 2 MMB CLI (Command Line Interface) Operations in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).
For details on TABLE 10.2 Functions provided by the MMB CLI, see the reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

TABLE 10.2 Functions provided by the MMB CLI

Function	Reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN)
Sets information.	2.2 Setting Commands
Displays information.	2.3 Display Commands
Updates firmware.	2.4.1 update ALL
Displays the version and update status of firmware.	2.4.2 show update_status

10.3 PSA Web-UI

The PSA Web-UI displays the status in and operates each partition of the PRIMEQUEST 1000 series system. The following lists the functions provided by the PSA Web-UI.
For details on TABLE 10.3 Functions provided by the PSA Web-UI, see the reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

Remarks
The PSA Web-UI is provided only for the PRIMEQUEST 1800E.
In the PRIMEQUEST 1800E2, SVS provides the management function of PSA. For details on the SVS function, see the SVS manual.

TABLE 10.3 Functions provided by the PSA Web-UI

Function	Reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN)
Displays a partition overview and OS information.	3.3 [Partition Information] Window
Displays a list of CPU information on a partition.	3.4 [CPUs] Window
Displays a list of DIMM information on a partition.	3.5 [DIMMs] Window
Displays information on the PCI devices connected in each partition.	3.6 [PCI Devices] Window
Displays the network status in a partition.	3.7 [Network] Menu
Displays a list of hard disks in a partition.	3.8 [Hard Disks] Window
Displays a list of hardware components (SB, IOB, CPU, DIMM, PCI device, GSPB, SAS disk unit, PCI_Box).	3.9 [Hardware Inventory] Window
Displays a history of the various actions (e.g., log output, REMCS transmission, SNMP trap transmission) executed by PSA.	3.10 [Agent Log] Window
Outputs a snapshot of information retained by PSA in CSV format.	3.11 [Export List] Window
Collectively downloads the log information (e.g., agent log, export data, PSA internal log, system log, event log) retained by a partition.	3.12 [PSA Logs Download] Window

10.4 PSA CLI

The following lists the functions provided by the PSA CLI.
For details on the functions in TABLE 10.4 Functions provided by the PSA CLI, see the reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

TABLE 10.4 Functions provided by the PSA CLI

Function	Reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN)
Operates an HDD.	4.2 Disk Management Command (diskctrl)
Starts or stops PSA.	4.3 PSA Start/Stop Command (y30FJSVpsa)
Collects PSA data for investigation.	4.4 Command for Collecting PSA Data for Investigation (getopsa)
Copies and updates the filter definition to the PSA work directory.	4.5 Filter Definition Update Commands (fltcpy, fltupdate)
Displays a local partition number on the standard output.	4.6 Local Partition Number Acquisition Command (getpartid)
Displays a serial number on the standard output.	4.7 Serial Number Acquisition Command (getserialno)
Sets the host that accepts SNMP packets.	4.8 SNMP Security Setting Command (setsnmpsec)
Collects firmware information.	4.9 Firmware Information Acquisition Command (getfwinfo)
Confirms information for the PCI card you want to replace and replaces the card.	4.10 PCI Card Operation Command (fjpciswap)
Opens a port used for PRIMECLUSTER linkage for the management LAN interface.	4.11 Firewall Setting Command for the Management LAN Interface (setmlanfw.sh)

10.5 UEFI

The following lists the functions provided by the UEFI. For details on the UEFI provided commands, see Chapter 6 UEFI Command Operations in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).
For details on the functions in TABLE 10.5 Menus provided by the UEFI, see the reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

TABLE 10.5 Menus provided by the UEFI

Function	Reference sections in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN)
Displays menus for migration to boot processing, Boot Manager, Device Manager, and Boot Maintenance Manager.	5.2 Boot Manager Front Page
Sends processing into automatic operating system startup and performs boot processing in the currently set boot sequence.	5.3 [Continue] Menu
Sets the boot devices.	5.4 [Boot Manager] Menu
Makes settings such as whether to assign an I/O space to each I/O device, CPU settings, and whether to enable PXE boot.	5.5 [Device Manager] Menu
Makes settings such as addition and deletion of boot options and boot priority changes.	5.6 [Boot Maintenance Manager] Menu

10.6 ServerView Suite

You can use ServerView Suite to visually confirm the PRIMEQUEST 1000 series configuration and the status of each part.

For details on how to operate ServerView, see the *ServerView Suite ServerView Operations Manager Server Management*.

CHAPTER 11 Error Notification and Maintenance (Contents, Methods, and Procedures)

This chapter describes the maintenance functions provided by the PRIMEQUEST 1000 series. It also describes the actions to take for any problems that occur.

11.1 Maintenance 252
11.2 Troubleshooting 263
11.3 Notes on Troubleshooting 277
11.4 Collecting Maintenance Data 278
11.5 Configuring and Checking Log Information 296
11.6 Firmware Updates 297

11.1 Maintenance

The PRIMEQUEST 1000 series supports hot maintenance of PSUs and fans. This enables maintenance of the system as it continues operating. Also, the PCI Hot Plug function can be used for hot maintenance of PCI Express cards.
For details and a list of the replaceable components, see CHAPTER 3 Component Configuration and Replacement (Addition and Removal).

Remarks
Field engineers perform the maintenance on the PRIMEQUEST 1000 series server.

11.1.1 Maintenance using the MMB

The MMB provides system maintenance functions through the [Maintenance] menu of the Web-UI.
You can use the [Maintenance] menu to back up and restore system configuration information.
For details on the [Maintenance] menu, see 1.6 [Maintenance] Menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

Maintenance following an MMB failure (in a single MMB configuration)

In a single MMB configuration, if the MMB cannot operate such as because of an MMB failure, use the following procedure.

1. Shut down the operating system (LAN) from a remote terminal.
2. Turn off the chassis AC power.
3. Replace the MMB.
4. Turn on the chassis AC power.

Remarks
In a single MMB configuration, hot replacement of the MMB is not possible.

11.1.2 Maintenance using PSA

PSA handles hardware problem monitoring, configuration management, and other such tasks on a partition.
This section describes the maintenance functions of PSA.

Remarks
The PSA Web-UI is provided only for the PRIMEQUEST 1800E.
In the PRIMEQUEST 1800E2, SVS provides the management function of PSA. For details on the SVS function, see the SVS manual.

Notes

- To operate the PRIMEQUEST 1800E, you need to first install PSA. If PSA is not installed, the following restrictions apply.
  - I/O (e.g., PCI card, HDD) error notification and trap notification to the administrator are disabled.
  - Notification about exceeded thresholds in S.M.A.R.T. monitoring of HDDs is disabled.
  - Operations management software cannot collect information on the partition side.
  - Even under an REMCS agreement, no software errors are reported.
  - Hot maintenance of HDDs is not possible. The partition would have to be stopped for maintenance.
  - PRIMECLUSTER linkage is disabled.

- For operation in Linux, do not change the output destination of the system log from/var/log/messages. If it is changed, the following restrictions apply.
  - I/O (e.g., PCI card, HDD) error notification and trap notification to the administrator are disabled.
  - Notification about exceeded thresholds in S.M.A.R.T. monitoring of HDDs is disabled.
  - Even under an REMCS agreement, no hardware or software errors are reported.

  Setting example: In RHEL5, /etc/syslog.conf has the following default setting. Do not change the file name "/var/log/messages".
  *.info;mail.none;news.none;authpriv.none;cron.none /var/log/messages

- Do not stop the Windows Printer Spooler service while Windows is running.
  For hardware configuration management, PSA uses WMI (Windows Management Instrumentation) to collect information from the operating system. If the Print Spooler service is not running, WMI reports an error and does not collect the information.

Operations management GUI

The GUI consists of the Web-UI functions for problem monitoring and configuration management on the partition side.
PSA on each partition is linked with the MMB firmware, so even if the partition does not have the Web server function, PSA enables display and operation of the partition from the MMB Web-UI.
The MMB firmware has a CGI (Common Gateway Interface, WebGate CGI) for interacting with the Web server function as shown in the following figure. PSA on each partition has the operations management GUI function, which consists of WebGate and HTML templates.
When the WebGate CGI receives a request from the user, it communicates with WebGate via TCP/IP and distributes the requested HTML template. WebGate acquires information from the source of data corresponding to the request (e.g., configuration information) and embeds the acquired information in the HTML template.
PSA thus provides the Web-UI functions for managing partition operation.

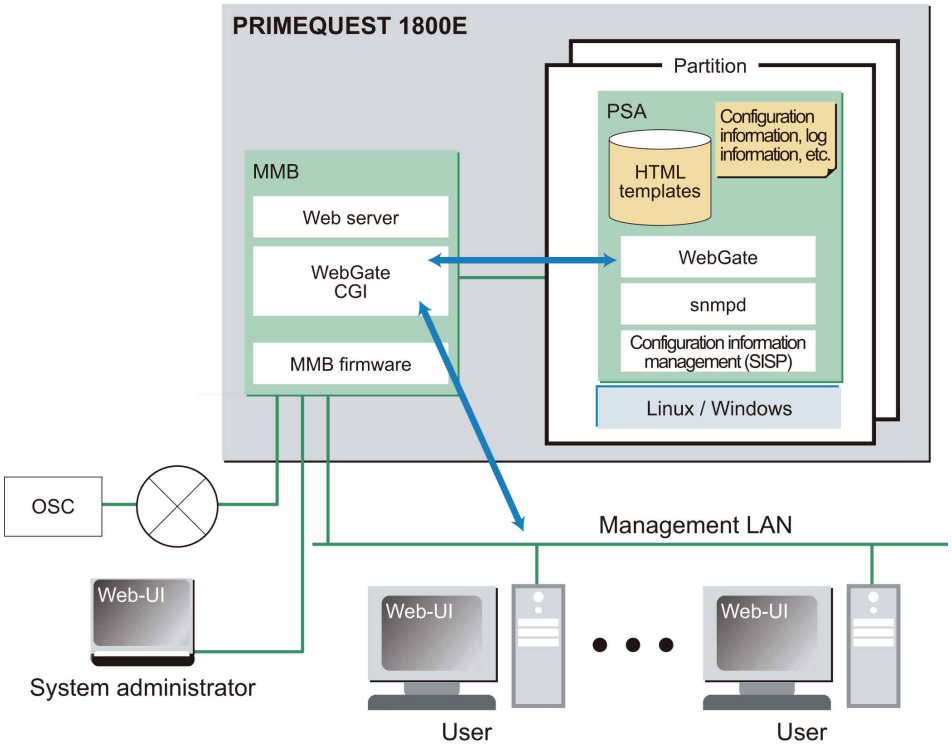


FIGURE 11.1 Web-UI functions

The following functions provided with the CLI (command line interface) enable command line operations and script operations from the operating system console:

- Disk management command (used by Fujitsu certified service engineers for hot replacement of disks)
- PSA start/stop command
- Command for collecting PSA data for investigation
- Filter definition update commands
- Local partition number acquisition command
- Serial number acquisition command
- SNMP security setting command
- Firmware information acquisition command
- PCI card operation command
- Firewall setting command for the management LAN interface

For details on the CLI, see the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

Hardware configuration management

This function displays hardware resources that configure a partition. It displays the following configuration information:

- SB configuration, IOB configuration, GSPB configuration
- CPU configuration (identification information such as the maximum number of mounted CPUs, CPU mounting locations, and CPU type)
- Memory configuration (detailed information such as the mounting location and memory type)
- PCI configuration (error status and detailed information such as the mounted PCI cards, mounted PCI devices, and PCI device type)
- Configuration of devices (e.g., HDD, tape drive) with SCSI/FC connections
- Network configuration (network interfaces)

Operating system information display

This function displays information on the operating system installed on the partition. It displays the following information:

- Operating system information (operating system type, operating system version, package installation information)
- Storage configuration information (device, capacity)
- Network configuration information (interface, connection status, speed)
- Operating system status (operation time, number of login users)

Hardware problem monitoring

PSA monitors errors output by PCI card drivers or other drivers on the partition. PSA also monitors proactive monitoring results returned from the S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology) function of hard disks. After detecting an error, PSA analyzes the error to identify the unit, records it in log information, and notifies the MMB and higher-level management software.

Log collection, analysis, and display

These functions collect, analyze, and display logs related to the hardware problem monitoring function.
PSA keeps a log of events and messages reported from firmware, drivers, or the operating system. PSA records each one in a log file and takes the specified action (e-mail notification, REMCS notification, or log output) for it.
To reduce the amount of log displayed, all recorded logs can be filtered before display. The possible filters include message notification time and target message type.
The following lists the log file information collected by PSA.

TABLE 11.1 Log file information

Log file type	Outline
Agent log	The agent log records events handled by PSA (e.g., recording to the operating system log, SNMP traps). (However, the events do not include those with event IDs 00000 to 09999 detected internally by PSA.) You can display this log and download it as a CSV-format file from the GUI.

Maintenance operations

This function supports hot replacement of hard disks on a partition.
The hard disk controller used by the PRIMEQUEST 1000 series server enables disk LED control and disk status checks through the SGPIO (Serial GPIO) function. You can use this provided function together with the disk management command to ensure safe maintenance with the SGPIO function at various times, such as when a hardware failure is detected or when a disk is replaced or added.

Remarks

The disk management command is supported in RHEL and Windows.

REMCS linkage

This function reports resource information or problems in a partition to the REMCS Center in linkage with the MMB.

For details on REMCS, see the *PRIMEQUEST 1000 Series REMCS Installation Manual* (C122-E120EN).
For details on using PRIMECLUSTER linkage, see the PRIMECLUSTER manuals.

Operations management software linkage

This is the function for linkage with operations management software.
The following lists the software that can be mounted on partitions and can be linked with PSA.
PSA can be linked with operations management software such as Systemwalker. The linkage uses SNMP (Simple Network Management Protocol).

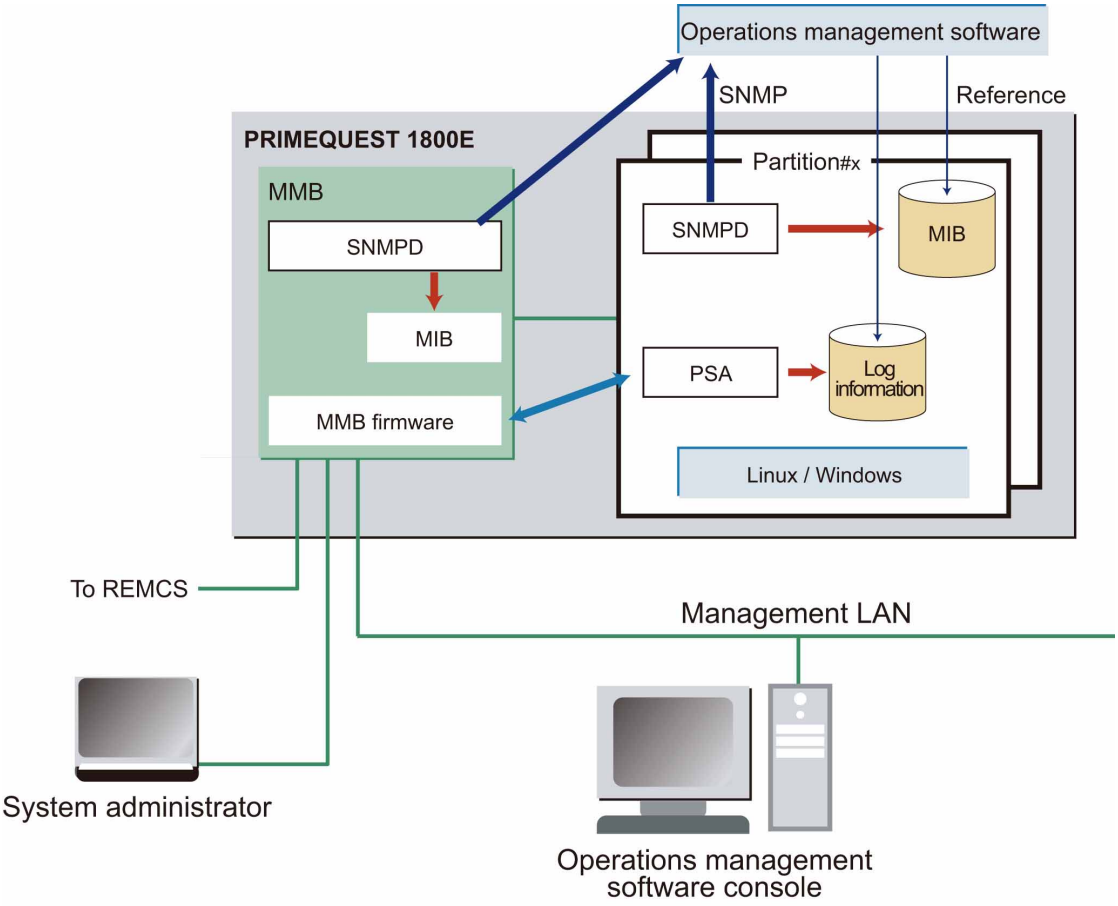


FIGURE 11.2 Operations management software linkage

- Targets of management with the MMB user interface
  The following provides an overview of the management targets of the MMB and PSA.
- Management targets of the MMB
  - Hardware implementation information and status in the rack
    (e.g., SB, PCI_Box, FANTRAY, PSU, KVM, MMB)
  - System information display and settings (e.g., rack settings, MMB)
  - Partition configuration management and settings
  - Maintenance operations (hardware replacement in the rack, display and collection of partition logs)
- Management targets of the PSA
  - Information management and operations within the partition
    (PCI card, connection I/O, operating system information display, operating system resource)
  - Maintenance operations (hot replacement of a PCI card or disk, display and collection of partition logs)

Note that hot replacement of a PCI card is supported only in Windows Server 2008, and hot replacement of a disk is supported only in Red Hat.

Available functions

The following lists the operations that can be performed from the GUI of the partition.

TABLE 11.2 Operations that can be performed from the GUI of the partition

Operation	Outline
Partition configuration information display	SB configuration, IOB configuration, GSPB configuration
	CPU configuration (identification information including the maximum number of mounted CPUs, CPU mounting location, and CPU type)
	Memory configuration (detailed information such as the mounting location and memory type)
	PCI configuration (error status and detailed information such as about the PCI cards mounted, PCI devices mounted, and PCI device type)
	SAS/FC connection device configuration (e.g., HDD, tape device)
	Network configuration (network interface, error status)
Operating system information display and operations	Operating system information (operating system type, operating system version, package installation information)
	Storage configuration information (device, capacity)
	Network configuration information (interface, connection status, speed, routing information)
	Operating system status (operation time, number of login users)
Maintenance operations	Display and saving of log information (agent log)
Export	Export of the current configuration and status in the partition

Information managed by partition

The following lists the information managed by partition.

TABLE 11.3 Information managed by partition

Information type	Details	
Hardware information	Model information	CPU information: mount information, status, type, version, frequency
		Memory information: mount information, status, type (size)
		SB/IOB/GSPB/PCI_Box information: mount information
		PCI card information: mount information, adapter name, detailed information

Information type	Details	
		Connection I/O information: mount information, type, detailed information
System information	Operating system: operating system type, version (revision)	
	Disk information: file system configuration, etc.	
	Network information: interface name (IPv4 or IPv6), IP address (IPv4 or IPv6), network type, MAC address, interface speed and current status (up, down, link down), packet size, etc.	
	Other I/O information	

Remarks

The MMB Web-UI supports the following browsers. Other browsers may incorrectly display the [MMB Web-UI] window.

- Microsoft Internet Explorer version 6 (Service Pack 1) or later
- Mozilla FireFox version 3 or later

11.1.3 Maintenance method

Maintenance is performed with the Maintenance Wizard on the MMB Web-UI from a terminal such as a PC connected to the MMB in the PRIMEQUEST 1000 series server.
The MMB provides a dedicated Maintenance LAN port for field engineers. To perform maintenance using the Maintenance Wizard, a field engineer connects an FST (PC used by the field engineer) to the Maintenance LAN port of the MMB of the maintenance target system.

Note

Field engineers perform the maintenance on the PRIMEQUEST 1000 series server.

11.1.4 Maintenance modes

The PRIMEQUEST 1000 series has several maintenance modes.
The maintenance modes prevent persons other than the field engineer from manipulating the power supply and suppress error reporting during maintenance work. The maintenance modes provide the following advantages:

- They prevent the system from switching to a status not expected by the field engineer because of a power supply operation by someone other than the field engineer.
- They prevent error reporting caused by a maintenance error (or maintenance work).

The following table lists the maintenance modes and their functions. Note that Operation mode is the normal operation mode and not a maintenance mode.

TABLE 11.4 Maintenance modes

Mode	Meaning
Operation [Normal operation]	Normal operation
Hot System Maintenance [Active for work (system)]	For maintenance work performed while the system power is on
Hot Partition Maintenance [Active for work (partition)]	For maintenance work performed while the target partition power is on
Warm System Power Off [Partition stopped for maintenance]	For maintenance work performed while the system power is on and the maintenance target partition power is off
Cold System Maintenance (breaker on) [Stopped for work (standby)]	For maintenance work performed while the system power is off and the AC power supply is on
Cold System Maintenance (breaker off) [Stopped for work (AC off)]	For maintenance work performed while the system power is off and the AC power supply is off

TABLE 11.5 Maintenance mode functions

Item		Operation	Hot System	Hot Partition	Warm System	Cold System (breaker on)	Cold System (breaker off)
Power supply operation	Administrator	Permitted	Permitted	Suppressed (*1)	Suppressed (*1)	Suppressed	Suppressed
	Field engineer	Suppressed	Suppressed	Permitted (*1)	Permitted (*1)	Permitted	Permitted
Wake On LAN (WOL)		Permitted	Permitted	Suppressed (*1)	Suppressed (*1)	Suppressed	Suppressed
Calendar function		Permitted	Permitted	Suppressed (*1)	Suppressed (*1)	Suppressed	Suppressed
OS boot		Permitted	Permitted	Suppressed Stops at BIOS (*1)	Suppressed Stops at BIOS (*1)	Suppressed Stops at BIOS	Suppressed Stops at BIOS
REMCS report		Permitted	Suppressed (*2)	Suppressed (*1)	Suppressed (*1)	Suppressed	Suppressed

*1 This pertains only to the maintenance target partition.

*2 Suppresses the REMCS report upon system failure (but reports partition failures).

11.1.5 Maintenance of the IOB and GSPB

This section provides notes on maintenance related to IOB and GSPB failures.
If a failure occurs in either of two partitions sharing an IOB, both partitions must be stopped for maintenance.
The IOB maintenance procedure is as follows.

1. The system administrator stops all the partitions belonging to the maintenance target.

2. After confirming that all the partitions have been stopped, a field engineer replaces the IOB.

Remarks

- The GSPB procedure is the same as the IOB procedure.
- You can use the Maintenance Wizard to confirm that all the partitions belonging to the IOB are stopped. We recommend you use the Maintenance Wizard when replacing the IOB (only done by a field engineer).
- After replacing the GSPB, set WOL for a new NIC from the operating system.
- For PXE boot, after replacing the GSPB, the boot order must be reconfigured.
  For details on how to reconfigure it, see 5.4.2 Overview of UEFI boot specifications in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

11.1.6 Maintenance policy/preventive maintenance

For details on the maintenance policy/preventive maintenance for the PRIMEQUEST 1000 series, see 9.1 Maintenance Policy/Preventive Maintenance in the *PRIMEQUEST 1000 Series General Description* (C122-B022EN).

11.1.7 REMCS service overview

REMCS (Remote Customer Support System) connects your server to the REMCS Center through the Internet to enable the system to send server configuration information and automatically report failures when they occur. REMCS is thus intended to facilitate prompt responses and solutions to problems.

The REMCS function of the PRIMEQUEST 1000 series are implemented by the following components:

- MMB: Collects hardware configuration information of the entire server, monitors the server for problems, and reports thereon to the REMCS Center.
- PSA (PRIMEQUEST 1800E) or SVS (PRIMEQUEST 1800E2): Collects configuration information of the PCI cards recognized in the partition and monitors them for problems.
- QSS: Collects troubleshooting information when a software failure occurs in a partition.

Communication with the REMCS Center is handled by the MMB. The MMB summarizes the information from each partition and sends it to the REMCS Center.
To receive the REMCS service, you will need a SupportDesk Product Basic Service agreement. Users without an agreement may register with the REMCS Center (registration) but cannot receive the service. For details on the SupportDesk Product Basic Service, contact your sales representative.

REMCS function

- Configuration information monitoring

Detects changes in the hardware or software configuration, and reports the latest configuration information to the REMCS Center.

- Problem notification
  When a hardware problem occurs in a server, automatically notifies the REMCS Center of the problem and sends problem information including logs to the REMCS Center. Software problems are not monitored automatically. To report a software problem, collect troubleshooting information using the SIRMS/QSS information collection tool and instruct the system to send the information.
  Whenever an event involving a hardware problem occurs in the same unit after the REMCS Center has been notified of the hardware problem, notification thereon to the REMCS Center is suppressed. Events detected by PSA are cleared when the operating system is rebooted or when PSA is stopped or restarted. When a problem with a notification level that is higher than that of an event for which notification is being suppressed occurs in the same part, problem notification takes place even within the notification suppression period. At this time, the notification suppression time is cleared to 0, and the notification suppression continues.
- Periodic connection
  Automatically connects to the REMCS Center at specified times to confirm the existence of the communication path and REMCS Agent.

Installing the REMCS function

The REMCS function of the PRIMEQUEST 1000 series (REMCS Agent) consists of the MMB and PSA installed on the partition side. The MMB REMCS Agent function is installed as standard. For details on the procedure for installing the function in PSA, see the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN).

Supported connection configurations

The PRIMEQUEST 1000 series supports only the connection configurations shown below. Each of these connection configurations uses only SMTP for communication with the REMCS Center.

- Internet connection (e-mail)
  Communication with the REMCS Center is executed via the Internet.
- P-P connection (ISDN: e-mail)
  Communication with the REMCS Center is executed with a point to point (P-P) system using a line such as ISDN line.

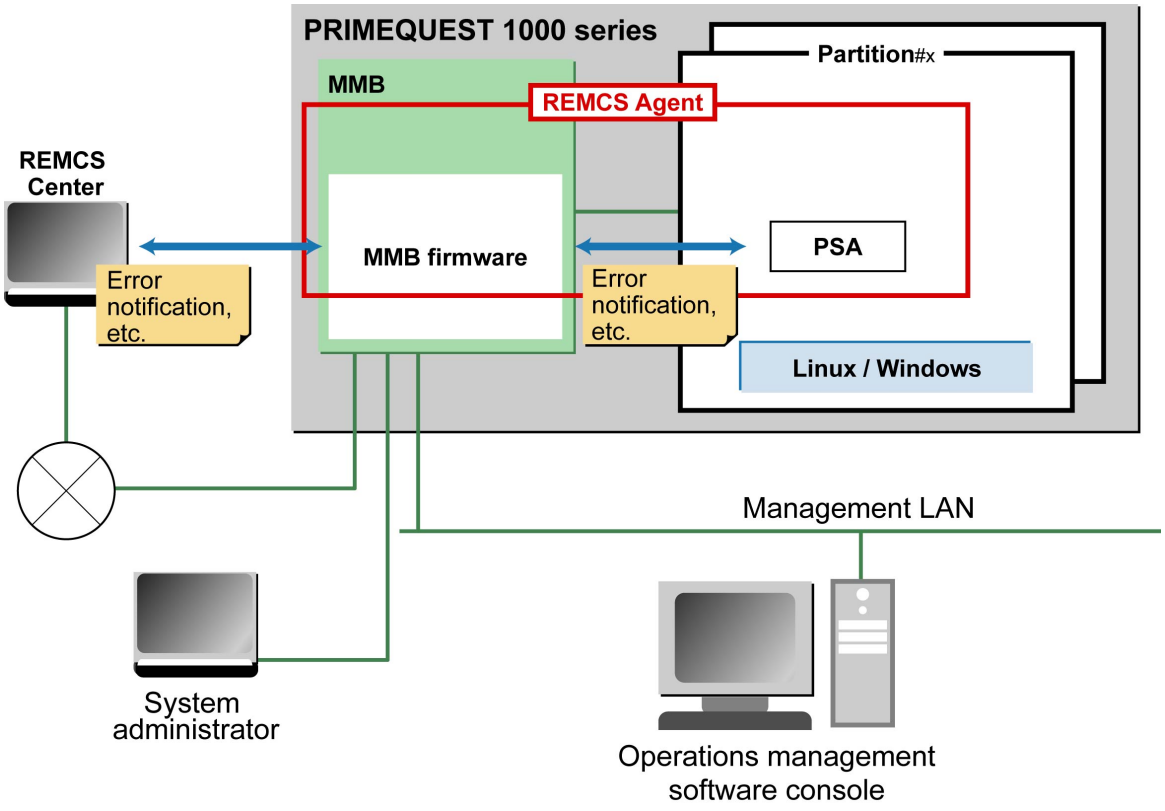
11.1.8 REMCS linkage

This function reports resource information or problems in a partition to the REMCS Center in linkage with the MMB.

REMCS Agent reports error information, log information, and other information of the PRIMEQUEST 1000 series system to the REMCS Center via the Internet or P-P connection.

REMCS Agent of the PRIMEQUEST 1000 series consists of the MMB firmware as well as PSA (on the PRIMEQUEST 1800E) or SVS (on the PRIMEQUEST 1800E2) and SIRMS installed in each partition. As the REMCS linkage in the figure shows, the MMB firmware monitors the entire system for problems, and reports them to the REMCS Center when it detects them. PSA (on the PRIMEQUEST 1800E) or SVS (on the PRIMEQUEST 1800E2) notifies the REMCS Center of hardware problem information and hardware configuration information detected by the operating system in the partition via the MMB firmware. It also reports the software configuration information and software problem information detected by SIRMS to the REMCS Center via the MMB firmware.

For details on REMCS, see the *PRIMEQUEST 1000 Series REMCS Installation Manual* (C122-E120EN).



* PSA runs on the PRIMEQUEST 1800E. SVS runs on the PRIMEQUEST 1800E2.

FIGURE 11.3 REMCS linkage

11.2 Troubleshooting

This section describes how to troubleshoot system problems.

11.2.1 Troubleshooting overview

The following shows the basic procedure for troubleshooting.

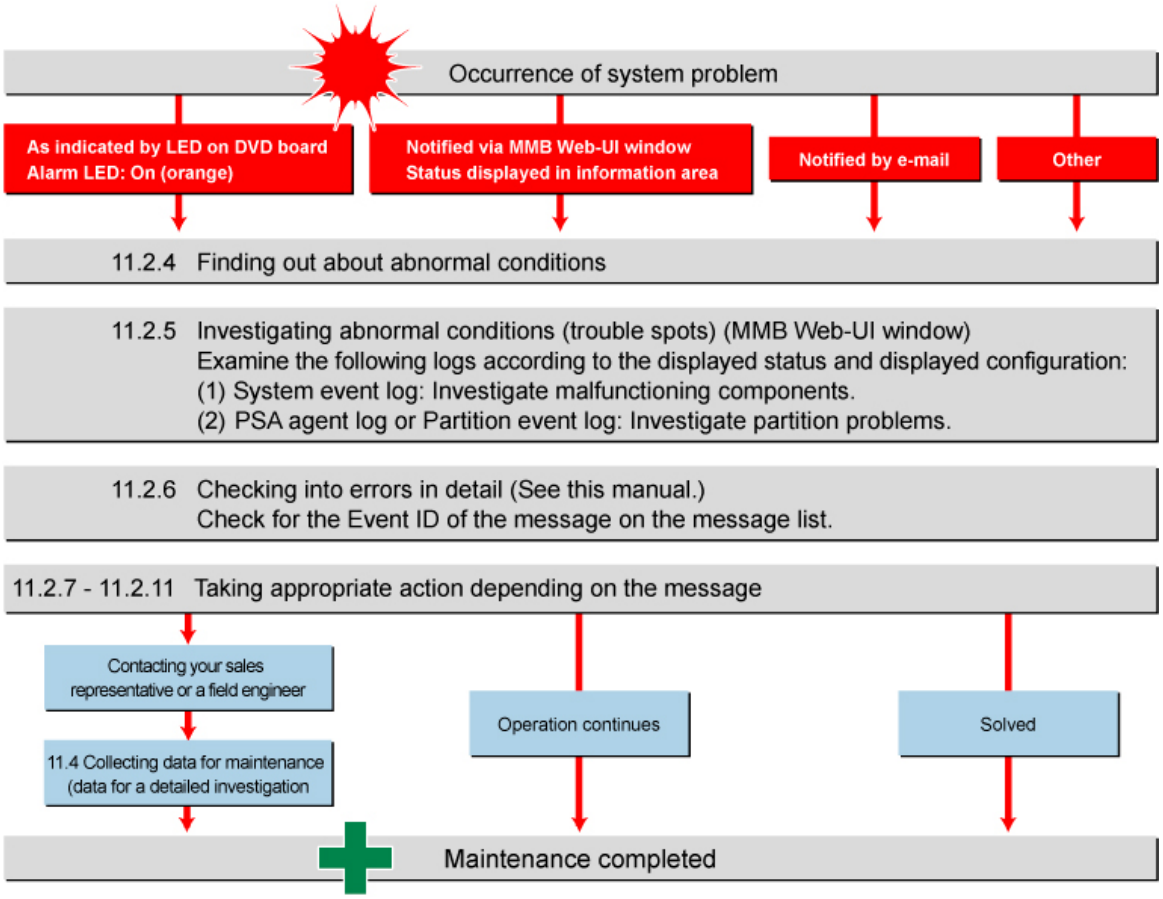
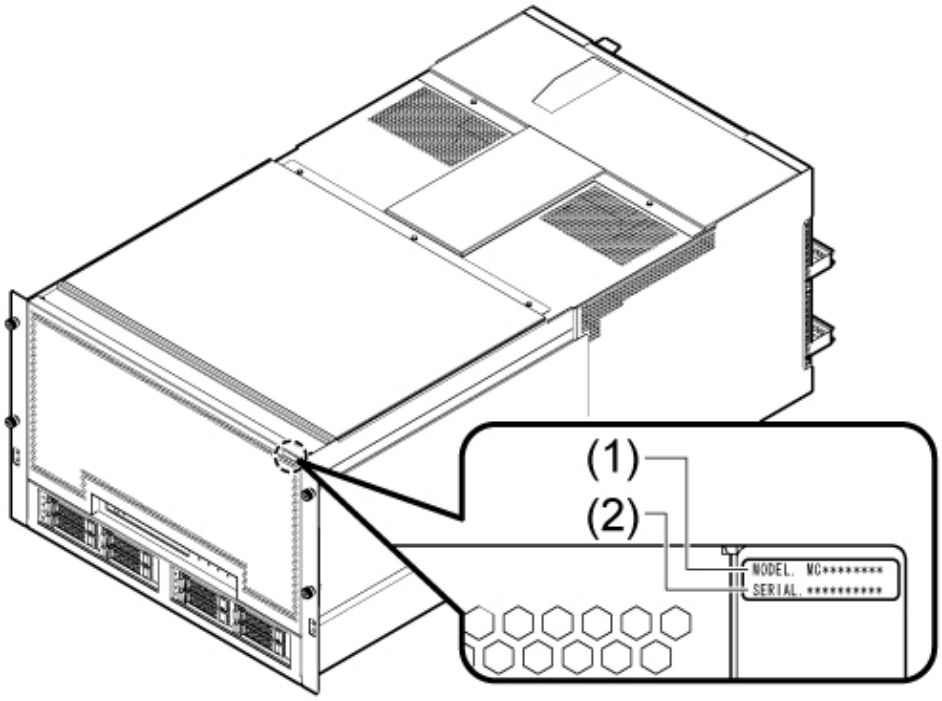

Occurrence of system problem
As indicated by LED on DVD board
Alarm LED: On (orange)
Notified via MMB Web-UI window
Status displayed in information area
Notified by e-mail
Other
11.2.4 Finding out about abnormal conditions
11.2.5 Investigating abnormal conditions (trouble spots) (MMB Web-UI window)
Examine the following logs according to the displayed status and displayed configuration:
(1) System event log: Investigate malfunctioning components.
(2) PSA agent log or Partition event log: Investigate partition problems.
11.2.6 Checking into errors in detail (See this manual.)
Check for the Event ID of the message on the message list.
11.2.7 - 11.2.11 Taking appropriate action depending on the message
Contacting your sales representative or a field engineer
11.4 Collecting data for maintenance (data for a detailed investigation
Operation continues
Solved
Maintenance completed

FIGURE 11.4 Troubleshooting overview

If a problem occurs in this product, troubleshoot the problem according to the displayed message.
If the error recurs, contact your sales representative or a field engineer.
Before making contact, confirm the unit, source, part number, event ID, and description of the error as well as the model name and serial number shown on the label affixed to the main unit.

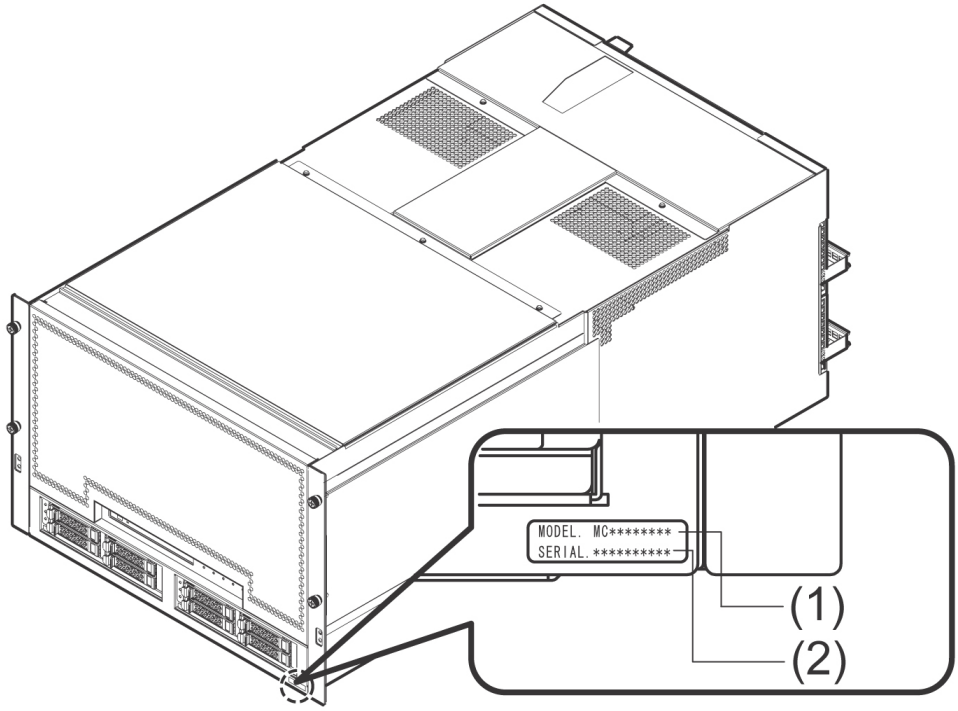
Remarks

Labels are affixed at the location shown in FIGURE 11.5 Label location (1) or FIGURE 11.6 Label location (2).



No.	Description
(1)	Model name
(2)	Serial number

FIGURE 11.5 Label location (1)



No.	Description
(1)	Model name
(2)	Serial number

FIGURE 11.6 Label location (2)

11.2.2 Items to confirm before contacting a sales representative

Before contacting your sales representative, confirm the following details.
Print the sheet in APPENDIX M Failure Report Sheet, and enter the necessary information.

- Items to confirm
  - Model name and type of the main unit.
    You can confirm the model name and type with the MMB Web-UI. You can also confirm them from the label affixed to the main unit.
  - Hardware configuration (types and locations of the supplied built-in options)
  - Configuration information (BIOS setup utility settings)
  - OS used
  - LAN/WAN system configuration
  - Symptoms (e.g., what happened at the time, message displayed)
    Sample messages:
    System event log: See FIGURE 11.11 System event log display .
    PSA agent log: See FIGURE 11.14 [Agent Log] window .
  - Occurrence date and time
  - Server installation environment
  - Status of various lamps

11.2.3 Sales representative (contact)

Contact your sales representative in the following cases:

- For a repair not under any support service (e.g., SupportDesk) contract
- For a repair under warranty during the warranty period
- For a repair not under any support service (e.g., SupportDesk) contract after expiration of the warranty period
  - Our authorized service engineer will repair the product on site. The service engineer will go to your premises on the next business day after the contact date.
  - The service charge (including the technical fee, parts costs, and transportation expenses) for each request depends on the product and work time.
  - Note that some products are outside the service range. Confirm that we will be able to repair your product when you contact us.

11.2.4 Finding out about abnormal conditions

If a problem occurs in the system, use the LEDs on the front of the device, any report on the MMB Web-UI windows, and any e-mail notification to understand the situation. E-mail notification requires settings made in advance.

Remarks

If [Part Number] or [Serial Number] (the content or information area) in the MMB Web-UI window displays "Read Error," contact a field engineer or your sales representative.

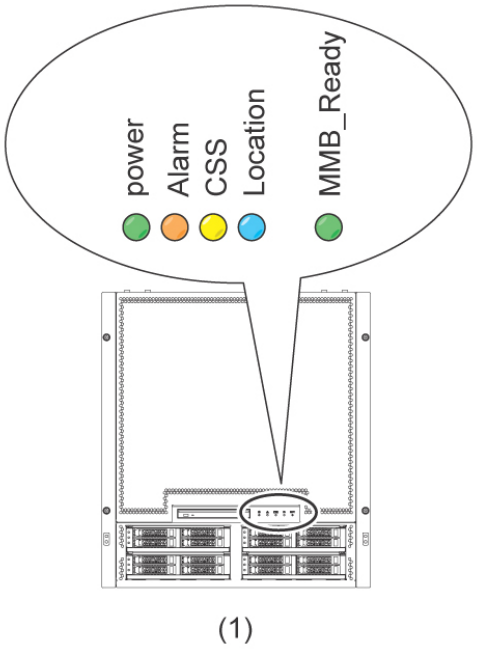
Before making contact, confirm the model name and serial number shown on the label affixed to the main unit.

LED display

The following figure shows the LEDs located on the front panel of the device. The Alarm LED indicates a problem inside the device.

If a problem occurs inside the device, the Alarm LED goes on (orange).

The Alarm LED stays off when the device is operating normally.



No.	Description
(1)	PRIMEQUEST 1800E2/1800E

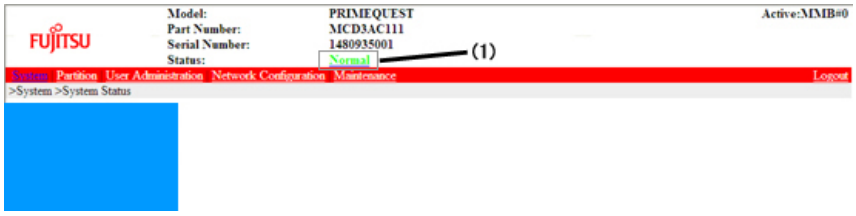
FIGURE 11.7 Alarm LED on the front panel of the device

As long as a problem remains inside the device, the Alarm LED is on. This indication does not change even if multiple problems have occurred.

Note that the front panel of the device also has the MMB-Ready LED. The MMB-Ready LED stays on in green when the device is operating normally. To start the MMB, select [System] - [MMB] on the Web-UI when the MMB-Ready LED is off. Select [Enable] in [Enable/Disable MMB] in the [MMB] window. Then, click the [Apply] button.

MMB Web-UI window

As shown in the following figure, you can use the MMB Web-UI window to check for any problems.



No.	Description
(1)	Displays the system status

FIGURE 11.8 System status display in the MMB Web-UI window

The MMB Web-UI window always displays the information area. [Status] in the information area displays the system status. The following table lists the Normal, Warning, and Error status indicators. You can view the details of a message about a trouble spot by clicking the displayed icon to jump to the [System Event Log] window.

TABLE 11.6 Icons indicating the system status

Status	Display color	Icon	
Normal (normal status)	Green	None	
Warning (warning status)	Yellow		A black ! mark in a yellow triangle
Error (critical status)	Red		A white x mark in a red circle

Remarks

If [Part Number] or [Serial Number] (the content or information area) in the MMB Web-UI window displays "Read Error," contact a field engineer or your sales representative.

Before making contact, confirm the model name and serial number shown on the label affixed to the main unit.

Alarm E-Mail notification

Alarm E-Mail notification can inform you of system problems.

You can configure Alarm E-Mail notification for problem occurrences by selecting [Network Configuration] - [Alarm E-Mail] from the MMB menu.

You can also filter the notification, such as by error status type, partition, or target component.

FIGURE 11.9 Alarm E-Mail settings window

Miscellaneous

Problems related to system startup or drivers may occur.

For details on these problems, see the *PRIMEQUEST 1000 Series Message Reference* (C122-E111EN).

If the status is one of the MMB error or warning statuses listed in the following operation interrupt criteria, stop the system and contact a field engineer or your sales representative.

Before making contact, confirm the model name and serial number shown on the label affixed to the main unit.

- Operation interrupt criteria
  - The Alarm LED of the MMB is on.
  - The Active LEDs of MMB#0 and MMB#1 are both off.
  - You cannot connect to the MMB Web-UI.
  - The Alarm LEDs of multiple boards in the device are on.
  - The MMB Web-UI displays [Read Error].
  - The [System Status] window of the MMB Web-UI displays [Not Present] for the status of every unit.

11.2.5 Investigating abnormal conditions

Investigate trouble spots. First, check the component (e.g., SB, IOB) and the partition where the problem occurred. The corrective action varies depending on various factors, including the location of the trouble spot, error level, and the system operation mode.

Finding out about a faulty component

Investigate the entire system component configuration and the faulty component.
Select [System] - [System Status] in the [MMB] menu window to display the window shown in the following figure. You can find out the status of each component.

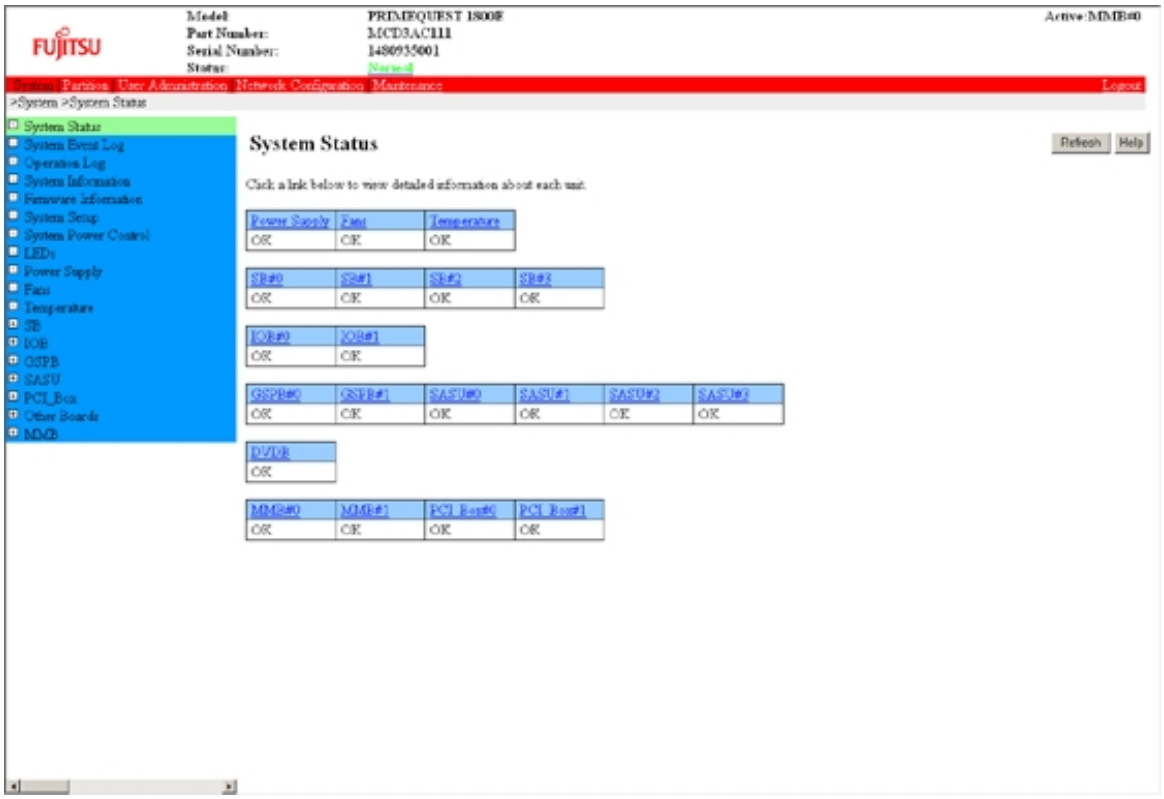


FIGURE 11.10 System status display

Click the icon displayed for an existing trouble spot to display a window showing the component status. If [Part Number] or [Serial Number] (the content or information area) in the MMB Web-UI window displays "Read Error," contact a field engineer or your sales representative.
You can view the component status and system event log contents by selecting [System] - [System Event Log] to open the [System Event Log] window.
The system event log information is important for an investigation, so first click the [Download] button at the bottom of the window to save the information. The information will be needed when you contact a field engineer or your sales representative.

For details on how to read system event log messages, see Chapter 1 Message Overview in the *PRIMEQUEST 1000 Series Message Reference* (C122-E111EN).

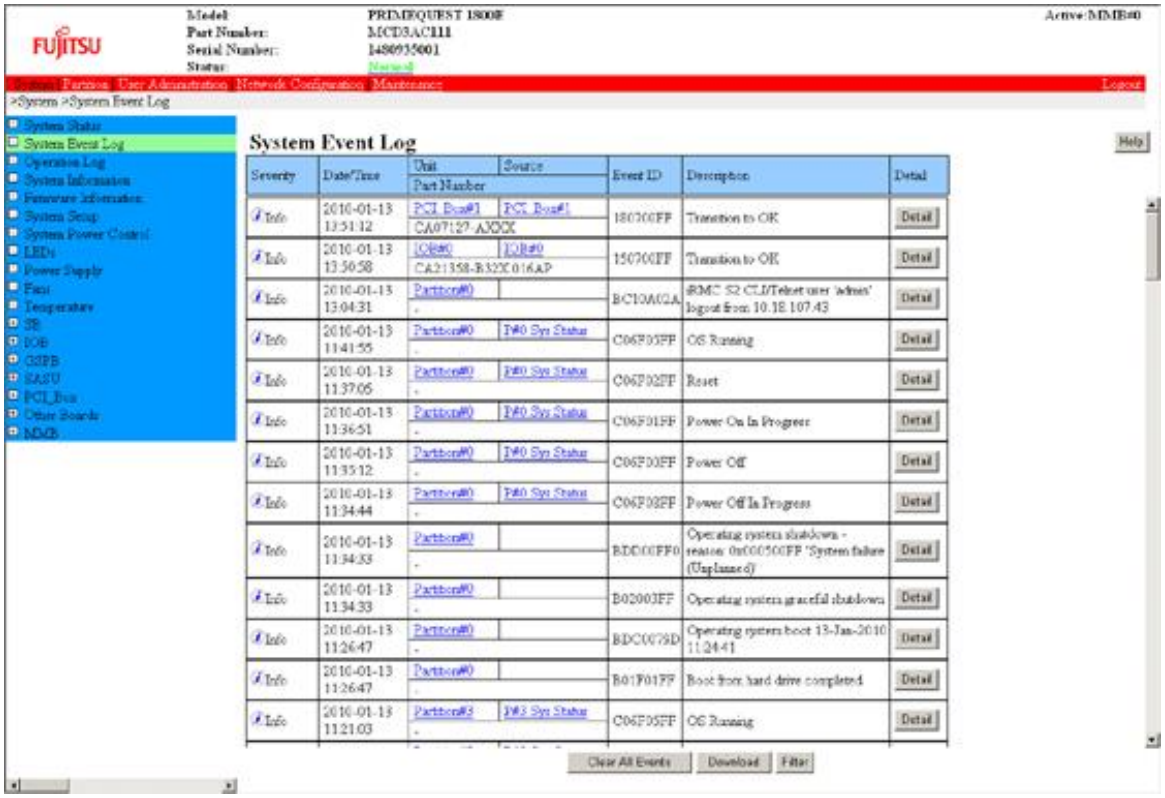


FIGURE 11.11 System event log display

Finding out about a faulty partition

Investigate the entire system partition configuration and the faulty partition.

Select [Partition] - [Partition Configuration] in the [MMB] menu window. You can find out the status of each partition.

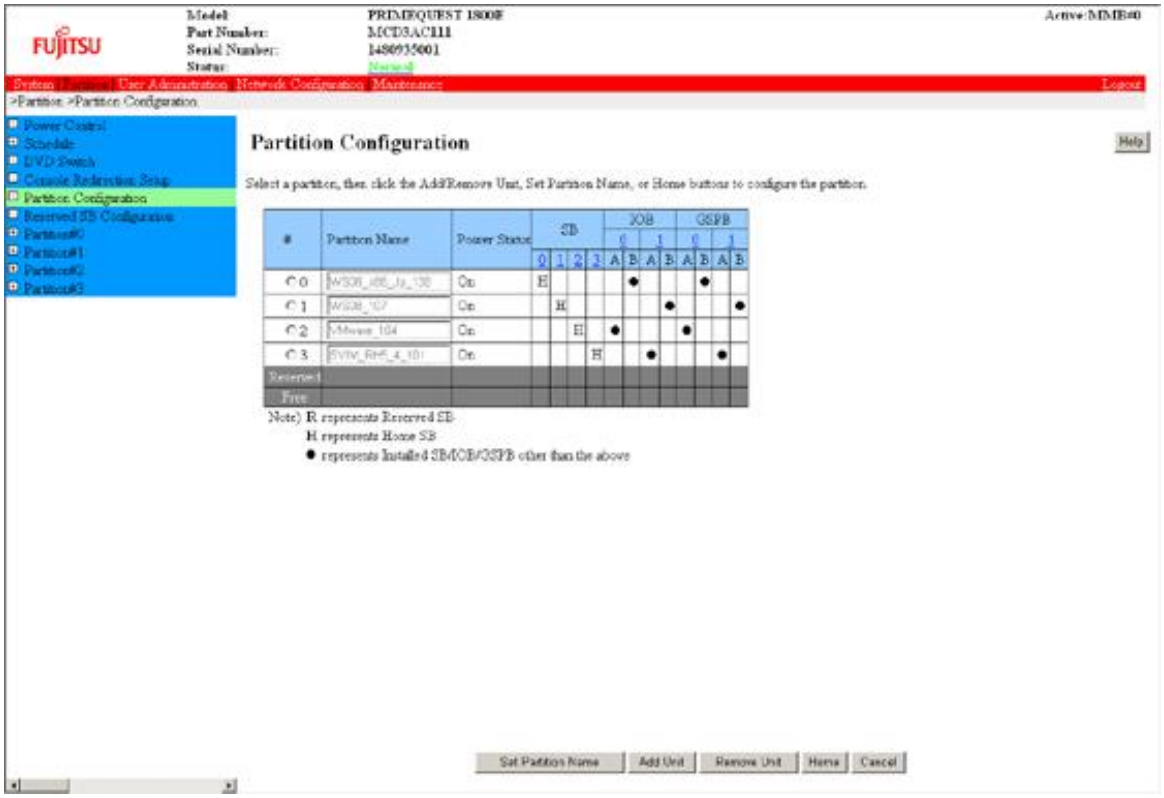


FIGURE 11.12 [Partition Configuration] window

Finding out the partition error status

Examine the partition error status.

Select the following in the MMB menu window.

- PRIMEQUEST 1800E2
  When SVmco or SVmcovm is installed: [System] - [Partition Event Log] window
- PRIMEQUEST 1800E
  When PSA is installed: [Partition] - [PSA] - [Agent Log] window
  When SVmcovm is installed: [System] - [Partition Event Log] window

On the [Partition Event Log] window or the [Agent Log] window, you can find out about problems in the partition from the displayed log.

For details on how to read agent log messages, see Chapter 3 PSA Messages in the *PRIMEQUEST 1000 Series Message Reference* (C122-E111EN).

The *Message Reference* lists the meanings of messages and corrective actions in order of event IDs. The [Partition Event Log] or the [Agent Log] window lists event IDs and message details to inform you of problems.

Remarks

For VMware 5, Seg:Bus:Dev.Func is displayed for [Unit] on the [Partition Event Log] window (Example: 0:0:25.0). For details on the method of identifying the Unit in this case, contact the distributor where you purchased your product, or your sales representative.

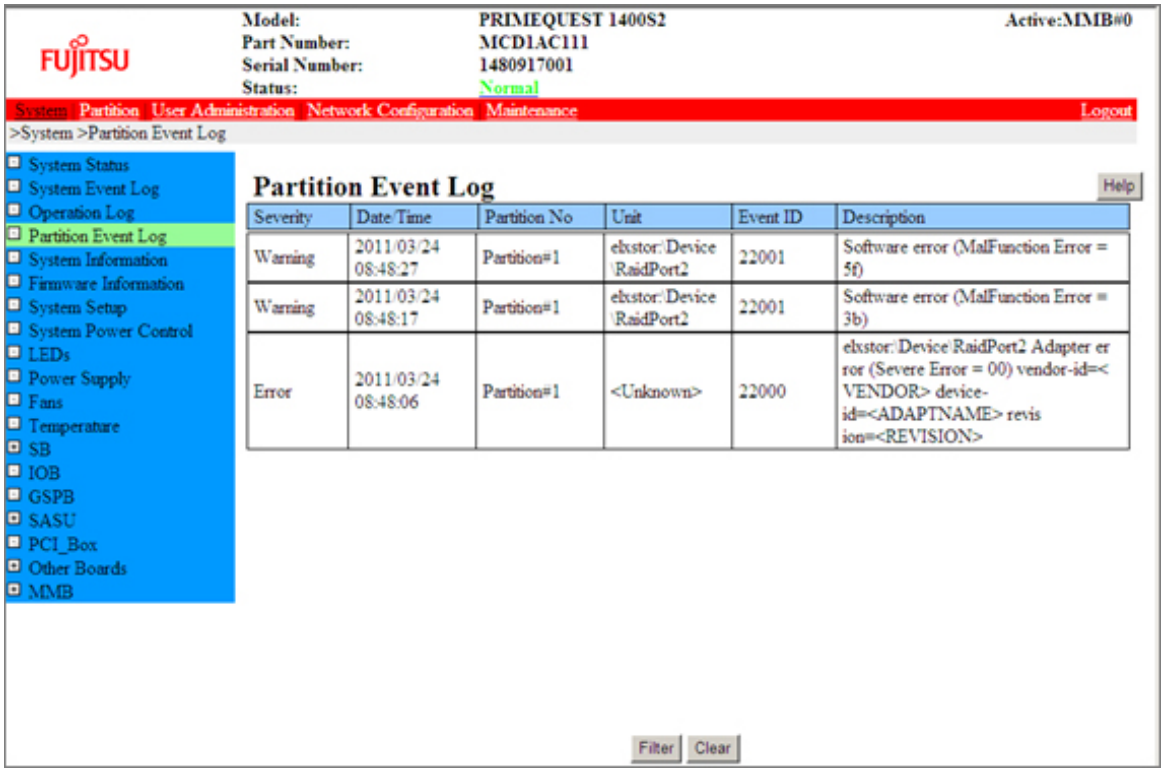


FIGURE 11.13 [Partition Event Log] window

Agent Log
Help
Results 8 of 8
To display detailed information, click on the entry number.
No. | Date/Time | Severity | Unit | Event ID | Description
1 | 2010-01-13 11:52:32 | Warning | IOB#0-PCIC#7-FUNC#0 | 21709 | e1000_express:Intel(R) PRO/1000 PT Dual Port Server Adapter #23 Adapter error (Could not establish link) vendor-id=8086 device-id=105E revision=06
2 | 2010-01-13 11:52:30 | Error | GSPB#0-GbE#4 | 21716 | e1000_express:Intel(R) 82576 Gigabit Dual Port Network Connection #27 Adapter error (EEPROM error) vendor-id=8086 device-id=10C9 revision=01
3 | 2010-01-13 11:52:26 | Warning | IOB#0-PCIC#7-FUNC#0 | 21709 | e1000_express:Intel(R) PRO/1000 PT Dual Port Server Adapter #23 Adapter error (Could not establish link) vendor-id=8086 device-id=105E revision=06
4 | 2010-01-13 11:52:24 | Error | GSPB#0-GbE#4 | 21716 | e1000_express:Intel(R) 82576 Gigabit Dual Port Network Connection #27 Adapter error (EEPROM error) vendor-id=8086 device-id=10C9 revision=01
5 | 2010-01-13 11:52:09 | Warning | IOB#0-PCIC#7-FUNC#0 | 21709 | e1000_express:Intel(R) PRO/1000 PT Dual Port Server Adapter #23 Adapter error (Could not establish link) vendor-id=8086 device-id=105E revision=06

FIGURE 11.14 [Agent Log] window

11.2.6 Checking into errors in detail

Check the details of messages to take appropriate action.

According to the message ID in the displayed log, check the message details in the list of messages in the *PRIMEQUEST 1000 Series Message Reference* (C122-E111EN). Then, take appropriate action.

- System event messages detected by the MMB: Chapter 2 MMB Messages in the *PRIMEQUEST 1000 Series Message Reference* (C122-E111EN)
- Messages detected by the partition: Chapter 3 PSA Messages in the *PRIMEQUEST 1000 Series Message Reference* (C122-E111EN)

Remarks

- Be sure to write down the message ID and message details because they will be needed when you contact a field engineer or your sales representative.
- If the list of messages in the *PRIMEQUEST 1000 Series Message Reference* (C122-E111EN) does not include the displayed message, contact a field engineer or your sales representative.

11.2.7 Problems related to the main unit or a PCI_Box

This section describes problems related to the main unit or a PCI_Box. It also describes how to correct the problems.

An LED on the main unit does not go on, or the orange LED is on.

- Cause: The main unit may have failed.
  Corrective action: Contact your sales representative or a field engineer. Before making contact, confirm the model name and serial number shown on the label affixed to the main unit.

An error message appears on your display.

- Cause: An error occurred in the device.
  Corrective action: Confirm the error message, and take action according to the description of the error.

The keyboard and mouse do not work.

- Cause: The cables are not correctly connected to the USB ports of the Home SB.
  Corrective action: Connect the cables correctly to the USB ports of the Home SB.

The DVD is not recognized.

- Cause: The DVD was not correctly inserted.
  Corrective action: Insert the DVD correctly.

[Part Number] or [Serial Number] in the MMB Web-UI displays [Read Error].

- Cause: A failure occurred and prevents the part or serial numbers from being read.
  Corrective action: Contact your sales representative or a field engineer. Do not execute [Reset] or [Force Power Off] on the partition until the problem is solved. Before making contact, confirm the model name and serial number shown on the label affixed to the main unit.

11.2.8 MMB-related problems

This section describes MMB-related problems and how to correct the problems.

No connection to the PRIMEQUEST 1000 series server can be established using the Web-UI.

- Cause 1: The setting of the IP address, subnet mask, or gateway is wrong.
  Corrective action: Referring to 3.3.3 Setting up the connection environment for actual operation in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN), set the correct value.
- Cause 2: A failure occurred in the network between the MMB console PC and the MMB USER port.
  Corrective action: Replace the faulty network device or LAN cable.
- Cause 3: A problem occurred in the internal network (e.g., internal hub) of the MMB.
  Corrective action: Switch the active MMB by using the following procedure:
  1. Log in to the standby MMB via telnet/ssh.
  2. Execute the set active_mmb command to switch the active MMB. For details on the set active_mmb command, see 2.2.10 set active_mmb in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

The MMB windows do not appear.

- Cause 1: The MMB LAN port is not enabled.
  Corrective action: Enable the LAN port.
- Cause 2: The MMB console PC is not correctly connected to the MMB USER port.
  Corrective action: Connect them correctly.
- Cause 3: The browser version is not supported.
  Corrective action: The MMB supports the following browsers:
  - Microsoft Internet Explorer version 6 (Service Pack 1) or later
  - Mozilla FireFox version 3 or later
- Cause 4: JavaScript is not enabled in the browser.
  Corrective action: The MMB Web-UI uses JavaScript. Enable JavaScript in the browser.

11.2.9 PSA-related problems

If a problem occurs in PSA, you can collect the PSA data for investigation by using the following procedure.

Remarks

PSA is provided only with the PRIMEQUEST 1800E.

In Linux

Use the system information collection tool (fjsnap) to collect the system information together with the PSA data for investigation.

Note that if you need to collect only the PSA data for investigation (such as when instructed by SupportDesk), use the command for collecting PSA data for investigation (getopsa) instead. For details on how to use getopsa, see 4.4 Command for Collecting PSA Data for Investigation (getopsa) in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

In Windows

Use the Software Support Guide to collect the system information along with the PSA data for investigation.

For details on how to use the guide, see the Software Support Guide manual.
Note that if you need to collect only the PSA data for investigation (such as when instructed by SupportDesk), use the command for collecting PSA data for investigation (getopsa) instead. For details on how to use getopsa, see 4.4 Command for Collecting PSA Data for Investigation (getopsa) in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

In VMware

Use the command for collecting PSA data for investigation (getopsa) to collect the PSA investigation data. You can also use the vm-support command to collect OS investigation data.
For details on how to use getopsa, see 4.4 Command for Collecting PSA Data for Investigation (getopsa) in the PRIMEQUEST 1000 Series Administration Tool Reference (C122-E110EN).
Use the vm-support command to execute the following command with root privileges.
<Example>

```
# vm-support
```

Remarks
In VMware, the core file, which is output in /var/core, is not automatically deleted.
We recommend deleting the core file after executing the vm-support command, as appropriate.

11.2.10 SVmco-related problems

If a problem occurs in SVmco, you can collect the SVmco data for investigation by using the following procedure.

Remarks
SVmco is provided with the PRIMEQUEST 1800E2.

Use Primecollect (hardware/software information collection command for SVS) to collect the system information along with the SVmco data for investigation.
For details on how to use Primecollect, see the *ServerView Suite PrimeCollect User Guide*.
Note that if you need to collect only the SVmco data for investigation (such as when instructed by SupportDesk), use the command for collecting SVmco data for investigation (getosvmco) instead.
For details on how to use getosvmco, contact the distributor where you purchased your product, or your sales representative.

11.2.11 Problems with partition operations

[Status] in the information area of the MMB Web-UI changes to "Error" when [Power Off], [Reset], or [Force Power Off] is executed on the partition or when the partition is shut down from the operating system. Also, the MMB Web-UI displays [Read Error] in [Part Number] and [Serial Number] of each component.

- Cause: Hardware may have failed.
  Corrective action: Contact your sales representative or a field engineer. Do not execute [Reset] or [Force Power Off] on the partition until the problem is solved. Before making contact, confirm the model name and serial number shown on the label affixed to the main unit.

During the partition power-on sequence from the beginning of power-on until execution of the reset process, if another partition is powered on in a scheduled operation, the booting of the partition powered on earlier may not complete.

- Cause: An MMB firmware restriction causes this problem.
  Corrective action: Execute [Force Power Off] on the partition causing the problem, and execute [Power On] again.

11.3 Notes on Troubleshooting

This section provides notes on troubleshooting.

- In the PRIMEQUEST 1000 series, if you unplug all the AC power cables while the device is in standby mode, the system event log records AC Lost (Severity: Info). This is neither a problem nor a failure. It is a normal situation.
  The following example shows this type of message.

  (Item): Severity Unit Source EventID Description
  --------- : ----------
  (Display): Info PSU#*** ******** Power Supply input lost during the cabinet power off

- In the PRIMEQUEST 1800E2, when SR-IOV is set to Disabled for Firmware version SB12011 or Firmware version SB11121, the following message is recorded in dmesg when RHEL 5.6 starts. It does not indicate a fault or error. The message is recorded because this device does not support SR-IOV, which is a virtualization support function.
  The following shows a dmesg record example.

  PCI: Failed to allocate mem resource #**:*****@******** for ****:**:**.*

11.4 Collecting Maintenance Data

System problems include cases where the partition abnormally stops and cases where the partition is running but hangs. In all such cases, you need to collect data for investigation to troubleshoot the problem.
Be sure to configure the memory dump before starting to use the PRIMEQUEST 1000 series server. Fujitsu uses this information to identify the cause of the system problem and solve it quickly. For an investigation, you need a separate SupportDesk agreement.

TABLE 11.7 System problems and memory dump collection

System status	Memory dump collection	See
Partition stopped abnormally	A memory dump for the partition has already been collected.	11.4.3 Collecting data for investigation (Windows) 11.4.4 Setting up the dump environment (Windows)

11.4.1 Logs that can be collected by the MMB

The MMB Web-UI can collect the events that occur in the PRIMEQUEST 1000 series system.
The SEL (system event log) can hold up to 32,000 events. When the system event log is full, each new entry will replace the oldest entry in the system event log.
You can filter the events to display, download event data stored in the SEL, and clear all the stored events in the SEL from the [System Event Log] window.
This section describes operations with the system event log.

Checking the event log

Procedure

1. Click [System] - [System Event Log].
   The [System Event Log] window appears.

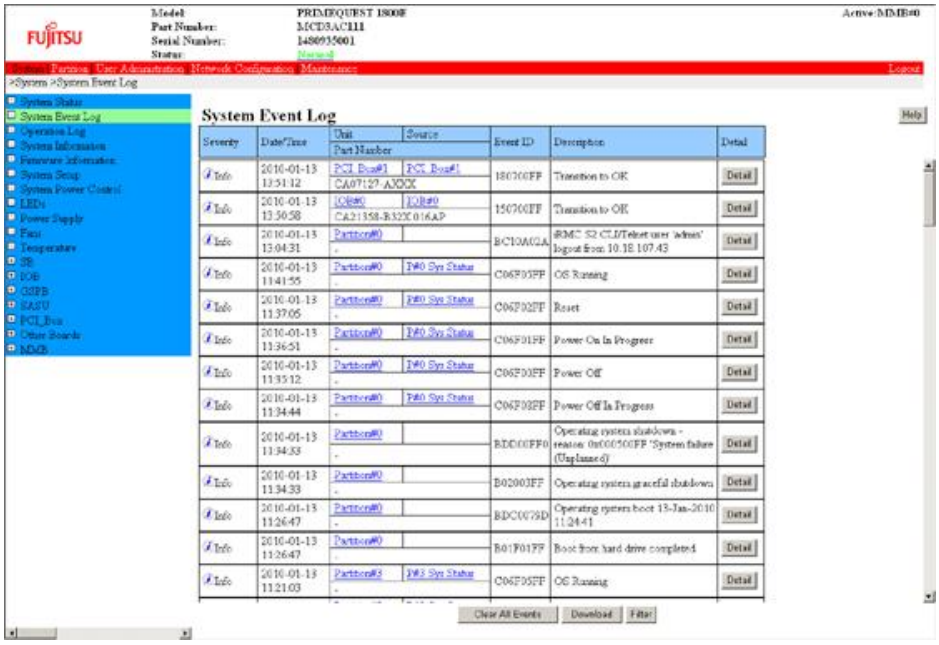


FIGURE 11.15 [System Event Log] window

2. Confirm the displayed contents.
   Click the [Download] button to download the event data stored in the SEL. Alternatively, click the [Filter] button to filter the events to display.
   Click the [Detail] button of an event to display details of the event. Click the [Cancel] button to clear settings and restore their previous values.

   Note
   Be sure to check with a field engineer before clearing events stored in the SEL.

Remarks

- If a problem occurs during operation, e-mail notification is sent. For details on how to specify whether to use e-mail notification and how to set the error level and e-mail destination for e-mail notification, see 1.5.11 [Alarm E-Mail] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).
- For an explanation of display items in the [System Event Log] window, see 1.2.2 [System Event Log] window in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

Downloading the event data stored in the SEL

A Fujitsu certified service engineer needs the event data stored in the SEL to analyze the system status.
Therefore, we may ask you to download the event data and submit it to a Fujitsu certified service engineer.

Procedure

1. Click the [Download] button in the [System Event Log] window.
   A dialog box for specifying the storage file and path appears.

2. Enter the pathname.
   The event data stored in the SEL is downloaded to the PC displaying the [Web-UI] window.

Filtering the events to display

Procedure

1. Click the [Filter] button in the [System Event Log] window.
   The [System Event Log Filtering Condition] window appears.

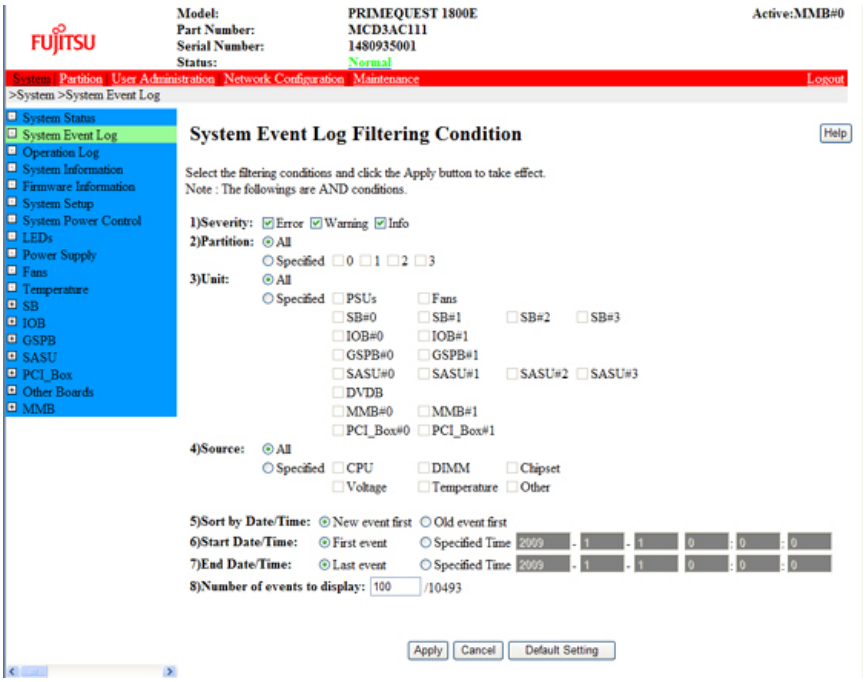

Model: PRIMEQUEST 1800E
Active:MMB#0
Part Number: MCD3AC111
Serial Number: 1480935001
Status: Normal
System | Partition | User Administration | Network Configuration | Maintenance | Logout
>System >System Event Log
System Status
System Event Log
Operation Log
System Information
Firmware Information
System Setup
System Power Control
LEDs
Power Supply
Fans
Temperature
SB
IOB
GSPB
SASU
PCI_Box
Other Boards
MMB
System Event Log Filtering Condition
Help
Select the filtering conditions and click the Apply button to take effect.
Note : The followings are AND conditions.
1)Severity: Error Warning Info
2)Partition: All Specified 0 1 2 3
3)Unit: All Specified PSUs Fans SB#0 SB#1 SB#2 SB#3 IOB#0 IOB#1 GSPB#0 GSPB#1 SASU#0 SASU#1 SASU#2 SASU#3 DVDB MMB#0 MMB#1 PCI_Box#0 PCI_Box#1
4)Source: All Specified CPU DIMM Chipset Voltage Temperature Other
5)Sort by Date/Time: New event first Old event first
6)Start Date/Time: First event Specified Time 2009 - 1 - 1 0 : 0 : 0
7)End Date/Time: Last event Specified Time 2009 - 1 - 1 0 : 0 : 0
8)Number of events to display: 100 /10493
Apply Cancel Default Setting

FIGURE 11.16 [System Event Log Filtering Condition] window

2. Specify the condition to filter events. Then, click the [Apply] button.
   The [System Event Log] window appears again. The window displays the events matching the specified conditions.
   To clear the specified conditions and return to the [System Event Log] window, click the [Cancel] button.
   To clear the specified conditions and restore the default values, click the [Default Setting] button.

TABLE 11.8 Setting and display items in the [System Event Log Filtering Condition] window

Item	Description
Severity	Select the severity of events to display by using the following check boxes. You can check multiple check boxes. - Error - Warning - Info All check boxes are checked by default.
Partition	Select the partition to display. Select the [All] or [Specified] radio button. If you select [All], filtering by partition will not be applied. In this case, the check boxes for partitions in [Specified] are grayed out and cannot be checked. If you select [Specified], you can check the check boxes for selecting a partition. Even after a switch to [All] and back to [Specified], the window retains the selections made with the [Specified] check boxes.

Item	Description
	[All] is grayed out and cannot be selected for users with Partition Operator accounts. Also, they can select partition filtering only for the target partition. The default settings are as follows: - For other than Partition Operator, [All] radio button. - For Partition Operator, [Specified] radio button and target partition.
Source	Select the source to display. Select the [All] or [Specified] radio button. If you select [All], filtering by source will not be applied. If you select [Specified], you can set filtering by source. Check the check box of a unit to display the events of that source. Even after a switch to [All] and back to [Specified], the window retains the selections made with the [Specified] check boxes. The default is [All].
Unit	Select the units to display. Select the [All] or [Specified] radio button. If you select [All], filtering by unit is not applied. If you select [Specified], you can set filtering by unit. Check the check box of a unit to display the events of that unit. Even after a switch to [All] and back to [Specified], the window retains the selections made with the [Specified] check boxes. The default is [All].
Sort by Date/Time	Select ascending or descending order for displaying events by using the radio buttons. The default is [New event first].
Start Date/Time	Select the first event or an event of the specified time by using the radio buttons. If you select [Specified Time], you can enter the start time. Even after a switch to [First Event] and back to [Specified Time], the window retains the time data entered in [Specified Time]. The default is [First event]. The default for [Specified Time] is 2009/01/01 00:00:00.
End Date/Time	Select the last event or an event of the specified time by using the radio buttons. If you select [Specified Time], you can enter the last time. Even after a switch to [Last Event] and back to [Specified Time], the window retains the time data entered in [Specified Time]. The default is [Last event]. The default for [Specified Time] is 2009/01/01 00:00:00.
Number of events to display	Specify the number of events to display. The denominator represents the total number of events logged. The specifiable maximum value is 3000. The default is 100.

Displaying details of an event

Procedure

1. Click the [Detail] button of the event to display its details.
   The [System Event Log (Detail)] window appears.

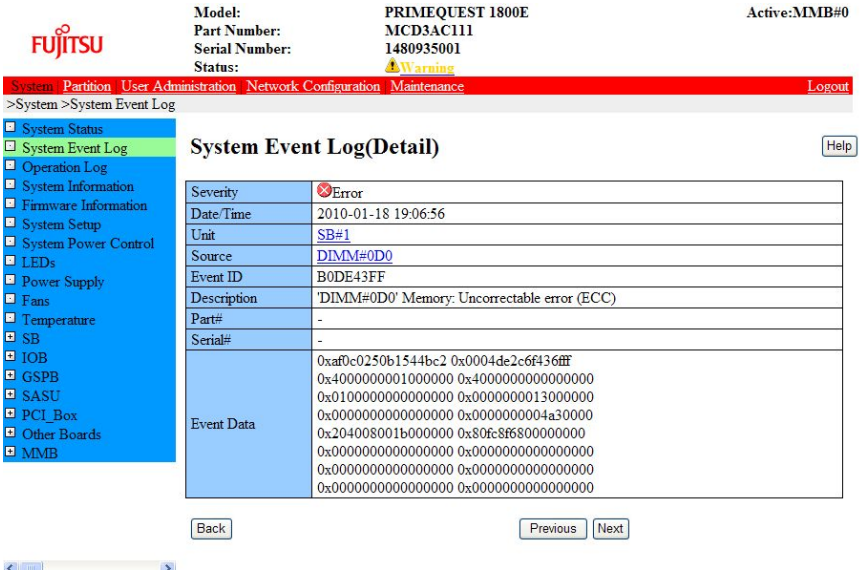


FIGURE 11.17 [System Event Log (Detail)] window

2. Click the button of the chosen operation.
   [Back] button: The display returns to the [System Event Log] window.
   [Previous] button: The window displays the previous event according to the display order in the [System Event Log] window. Note that the order of events displayed in the [System Event Log] window is not the actual order of stored events in the SEL.
   [Next] button: The window displays the next event according to the display order in the [System Event Log] window.

TABLE 11.9 Setting and display items in the [System Event Log (Detail)] window

Item	Description
Severity	Displays the severity of the event or error. - Error: Serious problem such as a hardware failure - Warning: Event that is not necessarily serious but is a potential problem in the future - Info: Event such as a partition power-on, reported for informational purposes
Date/Time	Displays the local time of occurrence of the event or error. Format: YYYY-MM-DD HH:MM:SS
Source	Displays the name of the sensor indicating the occurrence of the event or error.
Unit	Displays the unit whose sensor indicated the occurrence of an event or error. For example, if an error occurs at CPU#0 on SB#0, this item will display "SB#0." To identify the unit, the FRU in control of the sensor was identified from the event ID of the sensor. Then, the associated parent entry was retrieved from the Entity Association Record. The displayed name is the Board/Unit Name written in the FRU Record of the parent entry.

Item	Description
	Each unit has a link to a webpage for information on the unit. (You can see the part number and serial number of the unit there.)
Event ID	Displays the ID (8-digit hexadecimal value) that identifies the event details. For details on Event ID assignment, see Chapter 2 MMB Messages in the *PRIMEQUEST 1000 Series Message Reference* (C122-E111EN).
Description	Displays the details of the event or error. If the sensor recorded data other than Trig Offset in Event Data, this item also displays that Event Data. For example, the R and T values recorded by the sensor are displayed as the Reading Value and Threshold Value at the event occurrence time. However, for an event related to the mounting or removal of a board, this item displays the part number and serial number of the board.
Part#	Displays the Part# value stored in the SEL. If no Part# value is stored, this item displays "-".
Serial#	Displays the serial number of the component where the event occurred.
Event Data	Displays [Event Data] values in hexadecimal.

11.4.2 Logs that can be collected by PSA

PSA can collect agent logs. An agent log is a history of actions taken by PSA (log output, REMCS transmission, and SNMP trap transmission, etc). The following figure shows the [Agent Log] window of the MMB Web-UI.

Remarks

PSA is provided only with the PRIMEQUEST 1800E.

FIGURE 11.18 [Agent Log] window

The agent log stores up to 5,000 entries in the binary file format. After the number of stored entries reaches the maximum value, the new entry will overwrite the oldest entry. You can download the collected agent log from the Web-UI.

This section describes operations with the agent log.

Downloading an agent log

1. Click the [Download] button.
   The [Download File] dialog box appears.

2. Click [Save] in the [Download File] dialog box.
   The [Save As] dialog box appears.

3. Enter a file name in the [Save As] dialog box, select CSV as the file format (with the .csv extension). Then, click the [Save] button.
   This downloads the CSV file to the specified path. Then, the [Download completed] dialog box appears.

4. Click the [Close] button in the [Download completed] dialog box.
   The display returns to the [Agent Log] window.

Extracting entries from the agent log by using filtering conditions

1. Click the [Filter] button.
   The [Agent Log Filtering Condition] window appears.

2. To continue with setting filtering conditions, specify the conditions in the [Agent Log Filtering Condition] window and click the [Apply] button.
   This sets the specified conditions. Then, the display returns to the [Agent Log] window.

For details on the Web-UI operations, see the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

11.4.3 Collecting data for investigation (Windows)

If a problem occurs in Windows, data on the situation is required for ensuring a prompt and correct investigation. This section describes frequently required investigation data and how to acquire the data.
For an investigation, you need a separate SupportDesk agreement.

Software Support Guide and DSNAP

SSG and DSNAP are support tools for collecting the data necessary for investigation of software problems. If a problem occurs in your system, SSG and DSNAP enable your Fujitsu certified service engineer to correctly determine the system software configuration. This leads to a smooth investigation. (The engineer uses this information to determine how the system is configured and deployed. It includes a list of installed software programs, operating system settings, and event logs.)
SSG and DSNAP are executed from the administrator command prompt.
For details on how to use them, see the following references:
DSNAP: README_JP.TXT file in the *operating system installation drive*:\DSNAP folder
SSG (QSS acquisition tool): Help for SSG

Memory dump

A memory dump is an exact copy of the memory contents at time of occurrence of a problem. A memory dump is very useful in following cases.

- The desktop screen is frozen.
  Windows itself hangs during system operation. (For example, the desktop screen freezes, or you cannot operate the mouse or keyboard.)
- The responsiveness of the mouse or keyboard is too slow.
  Performance deteriorates during system operation when the responsiveness of the mouse or keyboard is too slow.

For details on memory dump file settings, see 11.4.4 Setting up the dump environment (Windows).
To acquire memory dump, select [Partition] and then the [Power Control] window of the MMB Web-UI. Specify [NMI] for the target partition.

Remarks

- Forced acquisition of a memory dump causes the server to stop.
- Collection of a memory dump may take a long time depending on the environment.

11.4.4 Setting up the dump environment (Windows)

Memory dump is a standard operating system function in Windows. However, before you can acquire dumps, you need to allocate an area for them on the disk.

This section describes how to set up the environment to acquire memory dumps in Windows. To ensure system recovery from a failure, configure the following to set up the memory dump environment before starting to use memory dumps:

Memory dump files and paging files

Memory dump and paging files are described below.

A memory dump file stores debug information on a STOP error (fatal system error) that occurred in the system. After installing the operating system and applications for operations, make settings for acquiring memory dumps.

Different information collected by a memory dump

The PRIMEQUEST 1000 series enables you to acquire the following four types of memory dump. Each type of memory dump gathers different information.

- Complete memory dump

  A complete memory dump records all the physical memory contents at the time when the system stops. It requires free space equivalent to the physical memory size plus about 1 MB on the boot volume. The system can store only one dump at a time. The new file would overwrite any existing dump file at the specified storage location.
- Kernel memory dump

  A kernel memory dump records the contents of the Kernel memory space only. It creates a dump file of 150 MB to 2 GB on the boot volume. The size varies depending on the situation. The system can store only one dump at a time. The new file will overwrite an existing dump file at the specified storage location.
- Minimum memory dump

  A minimum memory dump records the minimum required data to identify the problem. It requires 64 or 128 KB of free space. With this option, the dump function creates a new file each time the system stops unexpectedly.
- Automatic memory dump

  This type of dump is available beginning with Windows Server 2012. "Automatic memory dump" is the default setting in Windows Server 2012. An automatic memory dump records the same information as a kernel memory dump. It differs from a kernel memory dump as follows.
  - The default setting of the paging file size is a smaller value.
  - If all kernel space information could not be recorded, the paging file size is automatically expanded at the next start time. However, if all kernel space information could not be recorded, memory dump acquisition may fail.

TABLE 11.10 Memory dump types and sizes

Memory dump type	Memory dump file size	
Complete memory dump	Physical memory size + 1 MB (*1)	Overwrite (*2)
Kernel memory dump	Depends on memory space during system operation (about 150 MB to 2 GB).	Overwrite (*2)
Minimum memory dump	64 or 128 KB	Create new file
Automatic memory dump	Depends on memory space during system operation (about 150 MB to 2 GB).	Overwrite (*2)

*1 In a system using the Memory Mirror function, it is half the size of the mounted physical memory.

*2 The existing file is overwritten by default. You can change this setting to not overwrite the dump file. However, unlike the minimum memory dump, no new dump file would be created in such cases.

Notes

- Be sure to reserve enough free space on the hard disk before acquiring a memory dump.
- Select the optimum settings for system operation by taking the following into account:
  - The causes of some problems may not be identified because kernel memory dumps do not record user mode information.
  - The time taken to create a complete memory dump is proportional to the memory size, and the down time before a system restart is longer. Also, the saved dump file requires more free disk space.
  - No dump files can be stored at the iSCSI connection destination during internal disk boot and SAN (FC) boot.

Memory dump configuration methods

The methods of configuring memory dumps are described below.

<For Windows Server 2003/2003 R2/2008/2008 R2>

Configuring a complete memory dump

You cannot configure a complete memory dump from the dump setting window of the system. You need to change the following registry value to enable complete memory dumps.

HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\CrashControl
"CrashDumpEnabled" (Type: REG_DWORD, Data: 0x1)

After changing the registry, restart the system. For details on how to set overwrite and the path to the dump file, see "Configuring a kernel memory dump and minimum memory dump" below.

Configuring a kernel memory dump and minimum memory dump

Configure the memory dump file in the following procedure.

1. Log in to the server with Administrator privileges.

2. Confirm the free space on the drive to store the memory dump file.

3. Select [Control Panel] - [System].
   The [System Properties] dialog box appears.

4. Click the [Advanced] tab. Then, click [Startup and Recovery] - [Settings].
   The [Startup and Recovery] dialog box appears.

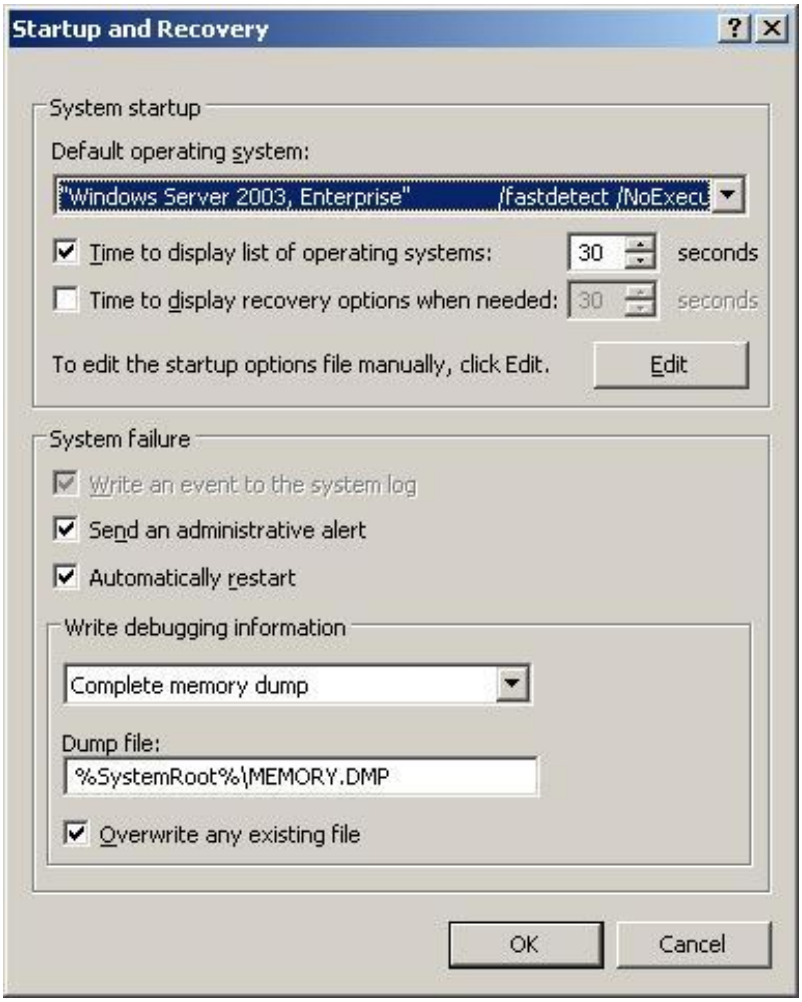


FIGURE 11.19 [Startup and Recovery] dialog box

5. Specify the following values.
   Select the type of memory dump file in [Write debugging information].
   - [Kernel Memory Dump] (recommended)
     The memory dump file records only the kernel memory.
     Specify the directory together with the full path for saving the memory dump file in [Dump File]. For the kernel memory dump, checking the [Overwrite any existing file] check box causes the debug information to overwrite the specified file each time.
   - [Small Memory Dump] (64 or 128 KB)
     The memory dump file records minimum information.
     Specify the directory together with the full path for saving the minimum dump in [Small Dump Directory].
     The directory specified in [Small Dump Directory] will contain the new file created each time a fatal error occurs.

6. Click the [OK] button to close the [Startup and Recovery] dialog box.

7. Click the [OK] button to close the [System Properties] dialog box.

8. Restart the partition.

After the partition restart, the settings take effect.

<For Windows Server 2012>

Configure the memory dump file in the following procedure.

1. Log in to the server with Administrator privileges.

2. Confirm the free space on the drive to store the memory dump file.

3. Click [Control Panel] - [System and Security] - [System] - [Advanced system settings].

4. Click [Settings] under [Startup and Recovery] on the [Advanced] tab.
   The [Startup and Recovery] dialog box appears.

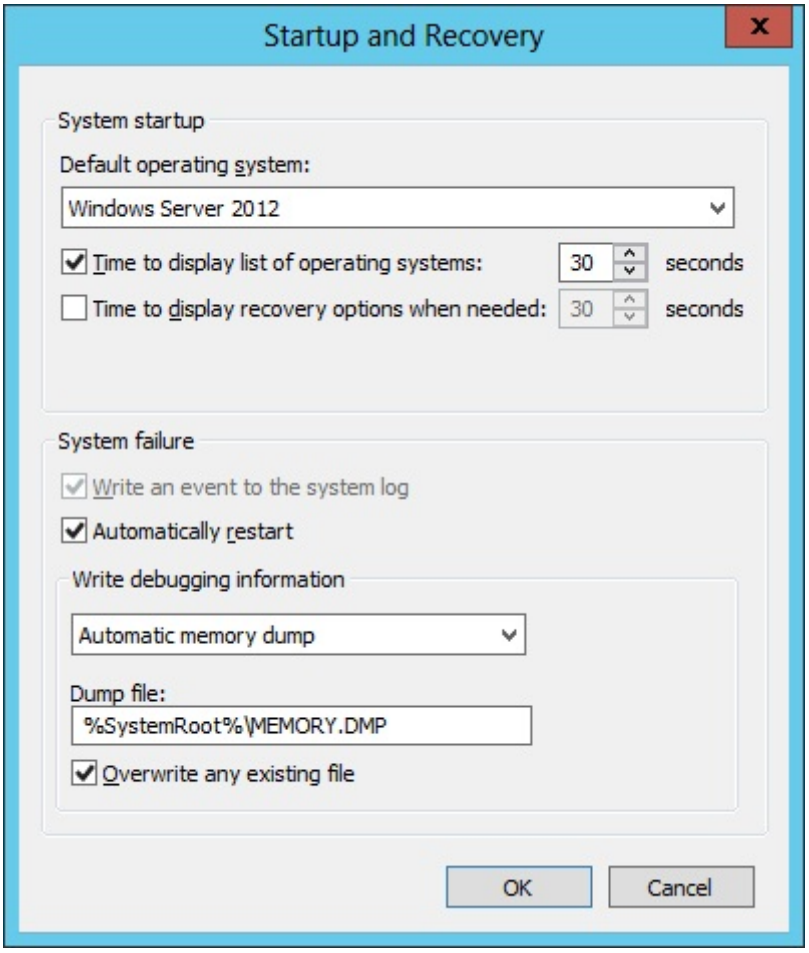


FIGURE 11.20 [Startup and Recovery] dialog box

5. Specify the following values.
   Select the type of memory dump file from [Write debugging information]. Set the dump file storage location in [Dump file].

6. Click the [OK] button to close the [Startup and Recovery] dialog box.

7. Click the [OK] button to close the [System Properties] dialog box.

8. Restart the partition.
   After the partition restart, the settings take effect. Then, make the following settings.

Confirming the memory dump configuration

Acquire a memory dump. Confirm that dump was created correctly. Also, measure the time taken to output the dump and restart the system so as to estimate the time required until business could resume. Then, reconsider the type of dump to acquire, as needed.
To acquire a memory dump, select [Partition] and then the [Power Control] window of the MMB Web-UI. Then, specify [NMI] for the target partition.
For details on the procedure, see Chapter 1 MMB Web-UI (Web User Interface) Operations in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

Configuring the paging file

Configure the paging file by using the following procedure.

1. Log in to the server with Administrator privileges.

2. Select [Control Panel] - [System].
   The [System Properties] dialog box appears.

3. Click the [Advanced] tab. Then, click [Performance] - [Settings].
   The [Performance Options] dialog box appears.

4. Click the [Advanced] tab.

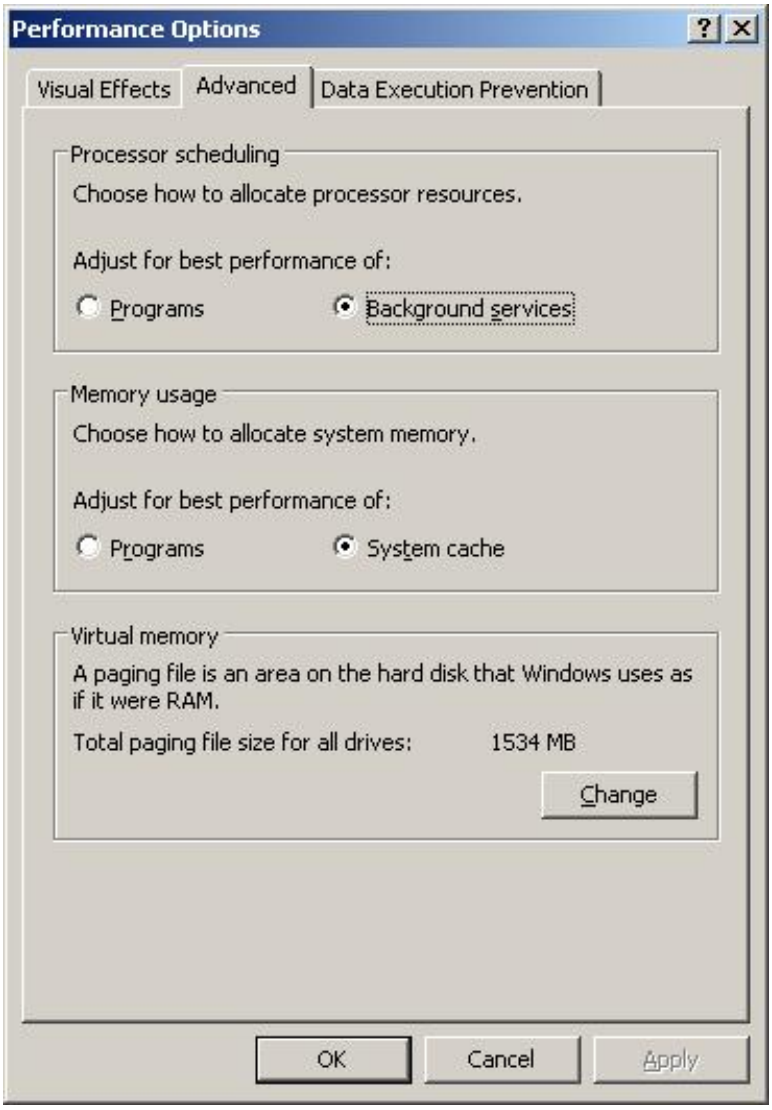


FIGURE 11.21 Advanced options dialog box

5. Click [Change] in [Virtual Memory].
   The [Virtual Memory] dialog box appears.

FIGURE 11.22 [Virtual Memory] dialog box

6. Specify the drive on which to create the paging file.
   Select the system installation drive in [Drive].
   [Drive] in [Paging file size for selected drive] displays the selected drive.

7. Select a value in [Custom size]. Enter a value in [Initial size].
   To correctly acquire a memory dump, the specified size must be equivalent to the size of mounted memory plus 1 MB or more. About 1.5 times the size of the mounted memory is recommended.

8. Enter a value in [Maximum size].
   Be sure to specify a value larger than or equal to [Initial size]. The same size as [Initial size] is recommended.

9. Save the settings.
   Click [Set] in [Paging file size for selected drive].
   This saves the settings. [Paging file size] in [Drive] displays the entered values.

10. Click the [OK] button to close the [Virtual Memory] dialog box.

11. Click the [OK] button to close the [Performance Options] dialog box.

12. Click the [OK] button to close the [System Properties] dialog box.

13. Restart the partition.
    After the partition restart, the settings take effect.

Note

In Windows Server 2003 or Windows Server 2003 R2, with the paging file specified to be created on a partition other than the system partition (normally, Drive C), the dump function will not create a dump file if a STOP error occurs. Do not move the paging file unless instructed to do so by SupportDesk.

<For Windows Server 2012>

Configure the paging file in the following procedure.

1. Log in to the server with Administrator privileges.

2. Click [Control Panel] - [System and Security] - [System] - [Advanced system settings].

3. Click [Settings] under [Performance] on the [Advanced] tab.
   The [Performance Options] dialog box appears.

4. Click the [Advanced] tab.

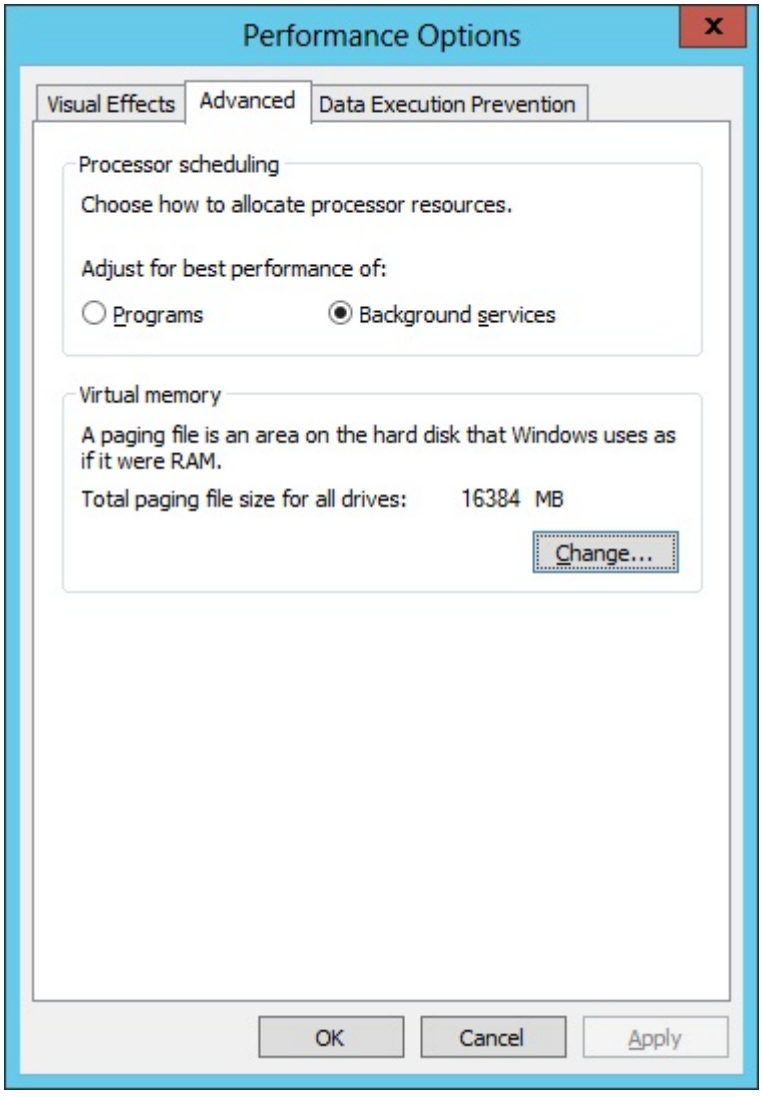


FIGURE 11.23 [Advanced] tab of the dialog box

5. Click [Change] under [Virtual memory].
   The [Virtual Memory] dialog box appears.

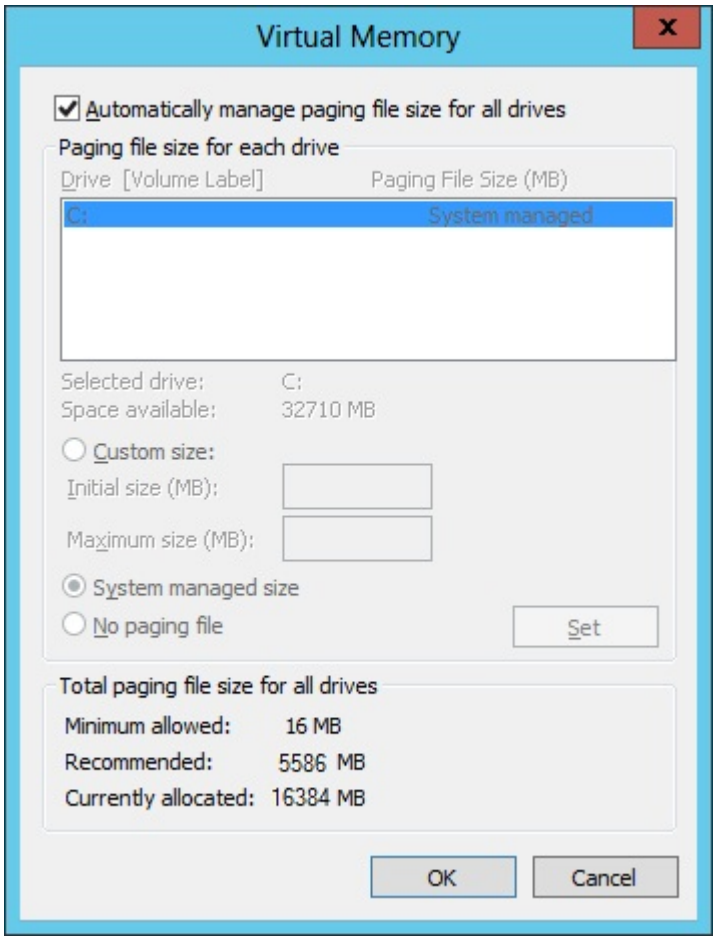


FIGURE 11.24 [Virtual Memory] dialog box

6. Uncheck [Automatically manage paging file size for all drives]. [Drive] specifies the drives on which paging files are created.
   The selected drive under [Drive] of [Paging file size for selected drive] is displayed.

   Notes

   - No dump files and paging files can be stored at the iSCSI connection destination during internal disk boot and SAN (FC) boot.
   - The file system for ReFS volumes cannot store paging files.

7. Select [Custom size], and enter a value in [Initial size].
   The specified size must be greater than the size of mounted memory plus 1 MB in order to acquire memory dumps normally. The recommended size is approximately 1.5 times the size of mounted memory.

   Notes

   - Check [Automatically manage paging file size for all drives].
   - Select [System managed size].

8. Enter a value in [Maximum size].
   Specify a value that is the same as or larger than [Initial size]. The recommended size is the same as [Initial size].

9. Save settings.
   Click [Set] under [Paging file size for selected drive].
   The settings are saved, and [Paging File Size] of [Drive] displays the set values.

10. Click the [OK] button to close the [Virtual Memory] dialog box.
    The message [You must restart your computer to apply these changes] appears. Click the [OK] button to close the message box.

11. Click the [OK] button to close the [Performance Options] dialog box.

12. Click the [OK] button to close the [System Properties] dialog box.

13. Restart the partition.
    After the partition restart, the settings take effect.

11.4.5 Acquiring data for investigation (RHEL)

If a problem occurs in RHEL, data on the situation is required for ensuring a prompt and correct investigation.

11.5 Configuring and Checking Log Information

This section describes how to configure and confirm the log information on problems that occurred in the system.

11.5.1 List of log information

This section lists the types of log information that can be acquired.

- Available log information
  1. System event log
  2. Syslog and event log
  3. Agent log (available only on the PRIMEQUEST 1800E)
  4. Partition Event Log
  5. Hardware error log
  6. BIOS error log
  7. Information on factors in partition power supply control
  8. Network configuration log information
  9. NTP client log information
  10. REMCS configuration log information
  11. Operation log information
  12. Physical inventory (including PCI_Boxes) information
  13. System and partition configuration information
  14. System and partition configuration file
  15. Information on internal rack sensor definitions

11.6 Firmware Updates

The PRIMEQUEST 1000 series server is configured with BIOS, BMC, and MMB firmware.
Each firmware is managed as a total version integrating different versions.
The firmware is updated from the MMB in batch (applying to all the firmware at all locations within the system).

For details on firmware updates, see 1.6.1 [Firmware Update] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

11.6.1 Notes on updating firmware

If the MMB or SB fails, perform maintenance on it before updating the firmware. Do not update the firmware in a configuration containing a faulty MMB or SB.

APPENDIX A Functions Provided by the PRIMEQUEST 1000 Series

This appendix lists the functions provided by the PRIMEQUEST 1000 series. It also lists management network specifications.

A.1 Function List 300
A.2 Correspondence between Functions and Interfaces 305
A.3 Management Network Specifications 309

A.1 Function List

The following lists the functions provided by the PRIMEQUEST 1000 series.

TABLE A.1 Functions

Function/operation	Minor item	Description
Operation functions		
User operation	User operation setting	Operation privilege setting for each user account
		Account synchronization between duplicate MMBs via LDAP
	GUI	Web user interface
	CLI	MMB command line interface
		PSA/SVS command line interface
External interface	KVM (local) (*)	Local VGA, USB (used only by field engineer)
	DVD	DVD switching between internal partitions
Remote console	Text console redirection	Serial console over LAN
	Video redirection	Function that uses PC connected to management LAN as graphical console
	Remote storage	Function that uses drive of PC connected to management LAN as partition drive
UEFI	UEFI interface	UEFI shell
		Boot Manager
Operation functions		
System construction	Management LAN setting	MMB management LAN setting
		Maintenance LAN (REMCS/CE port) setting
		Network setting between PSA and MMB
	Operating privilege/range setting	User account management
	Partition configuration	Partition creation/editing/removal
		CPU/DIMM configuration check
	Mirror Mode	Memory Mirror Mode (per partition)
	PCI_Box control	PCI_Box management, allocation to partitions
	Virtualization	MAC address fixing of LAN ICH between PSA and MMB
System operation/ power control	Start	Power-on by Web-UI/CLI/Wake On LAN
	Stop	Shutdown, forced power-off from Web-UI/CLI/OS
	Restart	Reboot from Web-UI/OS, partition reset
	Power recovery processing	Power-on control when power is restored from AC Lost

Function/operation	Minor item	Description
	Boot control	Boot device selection in Web-UI
		Diagnosis mode selection at boot
		Boot device selection by UEFI Boot Manager, boot option setting
	Scheduled operation	Automatic power-on/off at specified date and time specification
	Wake On LAN	Power-on via network
Automatic recovery	Degraded operation	Automatic degraded operation on CPU, DIMM, SB, etc.
	Reserved SB	SB automatic switching from faulty SB to Reserved SB
	ASR	Automatic restart of partition when failure occurs
Continuous operation	Continuous operation	Processing takeover between duplicate MMBs
		Recovery by MMB or BMC reset, continuous partition operation
Ecological operation	Power consumption management	Cabinet power consumption monitoring, notification to higher-level software
	PSU power-on count control	PSU/DDC power-on control only as needed, and status display
	FAN speed control	Optimum control of FAN speed
	CPU voltage/dynamic frequency control	Dynamic control of CPU P-state according to operating rate of application
Time synchronization	NTP client	NTP client
Monitoring and reporting functions		
Hardware monitoring and reporting	Hardware problem monitoring	Hardware problem monitoring by MMB/BMC/UEFI/PSA
	Hardware life-cycle monitoring	Life-cycle monitoring of RAID battery backup unit
	Partition problem monitoring	Watchdog Timer monitoring by MMB/UEFI/PSA
	Power control problem monitoring	Power control sequence problem monitoring
	FAN speed problem monitoring	Fan speed problem monitoring
	Voltage problem monitoring	Voltage problem monitoring
	Temperature problem monitoring	Temperature problem monitoring
	Hardware proactive monitoring	Proactive monitoring of CPU, DIMM, and HDD hardware failures
	External reporting	External reporting by e-mail, SNMP, or REMCS

Function/operation	Minor item	Description
	Event monitoring	Sensor-detected event monitoring
	Threshold monitoring	Threshold monitoring of temperature, power voltage, and fan speed
Status display	LED display	Display of MMB and system status
		Location display (Location LED)
		Faulty component display
	Eco-related status display	Cabinet power consumption display
		FAN speed display
		PSU/DDC power-on status display
		Temperature display
		CPU voltage/frequency display
		Eco status acquisition from higher-level software (SNMP)
Log	Log type	Content improvement/history information enhancement of MMB-collected log - System event log - Hardware and UEFI error log - Power control and factor information - Network setting and log - MMB operation log, login record - Firmware version - Mounting unit information - Partition configuration and setting - Sensor information - Various firmware log dumps
		PSA-collected log (PRIMEQUEST 1800E only) - Agent Log - Syslog - Configuration information
		SVS-collected log
	Log download	Batch download of MMB-collected logs (SEL download)
		Batch download of PSA logs (PRIMEQUEST 1800E only)
Hardware error processing	Fault location	Faulty component indication
	WHEA support	Support of Windows Hardware Error Architecture
Maintenance functions		
Component replacement	Replacement target	Cold replacement, non-hot/hot-system/hot maintenance
		Hot maintenance support by the hot plug
	Replacement target component indication	Replacement target component indicated by SEL or LED
	Hot Plug	PCI card, HDD

Function/operation	Minor item	Description
FRU management	FRU management	FRU information management for FRU management target components Serial No., part No., product name, etc.
		System information management and backup by FRU
Log management	Log collection	Log collection and generation management by MMB
	Log clear	MMB/PSA log clear
Firmware management	Version display	Overall version display
	Firmware update	Batch firmware update in Web-UI/CLI
		Version matching between SBs by MMB (UEFI/BMC)
		SB version confirmation at power-off
Configuration setting information management	Configuration setting information save and restore	Save and restoration of MMB/UEFI/REMCS information
Maintenance guidance	Maintenance wizard	Component replacement procedure instructions on Web-UI (used only by field engineer)
Failure cause search	Internal log trace	MMB/BMC/PSA internal log acquisition
		Isolation of cause of communication failure between MMB and BMC
	Dump function	MMB core dump
	Hardware log	CPU/chip set hardware log
Remote maintenance	REMCS	REMCS - Hardware failure information notification - System configuration information notification
Redundancy functions		
Network	Management LAN duplication	Management LAN duplication switching
Power supply	Dual power feed	Dual power feed monitoring
	PSU redundancy	PSU N+1 redundancy monitoring and control
Unit	FAN redundancy	Fan redundancy monitoring and control
	MMB duplication	MMB duplication control
	SB redundancy	Faulty SB switching with Reserved SB
	Internal HDD redundancy	RAID configuration
Component and module	DIMM duplication	Memory Mirror mode (each partition)
	Firmware storing memory duplication	FWH duplication

Function/operation	Minor item	Description
System clock	Clock multiplexing	PRIMEQUEST 1000 series server has oscillator on each SB. Distribution from Home SB
System	Cluster in cabinet	Independent clock in each partition
External linkage functions		
External IF/API	IPMI/RMCP	IPMI/RMCP interface
	SNMP	SNMP interface
	telnet/ssh	Access to MMB CLI via telnet/ssh
	http/https	Access to MMB Web-UI via http/https
	NTP	Time synchronization with NTP client of MMB
EMS linkage	Other management software linkage	Linkage with server management software of each company
Security functions		
Security setting	External IF security setting	Network security setting (SSL, SSH, etc.)
User management/ authentication	User authentication	MMB login account management
Audit trail	Operating log	Records such as MMB operating log and login history, etc.

* For the PRIMEQUEST 1000 series, only field engineers are permitted to operate the console with the front panel open.

A.2 Correspondence between Functions and Interfaces

The following shows the correspondence between the functions provided by PRIMEQUEST 1000 series and interfaces.

Remarks

PSA Web-UI is provided only with the PRIMEQUEST 1800E.

TABLE A.2 Correspondence between functions and interfaces

Function	MMB Web-UI	MMB CLI	UEFI	PSA Web-UI	PSA CLI/ SVS CLI
System information display					
System status display (Error, Warning)	Supported				
System event log (SEL) display	Supported				
System event log (SEL) download	Supported				
MMB Web-UI/CLI operating log display	Supported				
System information display (P/N, S/N)	Supported				
Firmware version display	Supported	Supported			
Hardware status display					
LED status display	Supported				
LED operation (on, clear, blinking)	Supported				
PSU (power supply unit) power-on count and status display	Supported				
System power consumption display	Supported				
FAN status monitoring and FAN speed display	Supported				
Temperature monitoring and display	Supported				
Voltage monitoring and display	Supported				
SB status display (CPU, DIMM, chip set, BMC, DDC)	Supported				
IOB status display	Supported				
GSPB status display	Supported				
SAS disk unit/SAS array disk unit status display	Supported				
DVDB status display	Supported				
MMB status display	Supported				

Function	MMB Web-UI	MMB CLI	UEFI	PSA Web-UI	PSA CLI/ SVS CLI
PCI_Box status display	Supported				
System settings					
Primary and secondary power feed	Supported	Supported			
Power-on setting at power recovery	Supported	Supported			
Shutdown delay time at power failure	Supported	Supported			
Start delay time at power recovery	Supported	Supported			
Installation altitude	Supported	Supported			
PSU redundancy setting	Supported	Supported			
System operation					
System power control (On/Off/ Force P-off)	Supported	Supported			
Partition configuration and operation setting					
Partition configuration	Supported	Supported			
Reserved SB allocation	Supported	Supported			
Console redirection setting	Supported				
DVD assignment to internal partition	Supported				
Memory Mirror mode	Supported	Supported			
CPU setting			Supported		
Flexible I/O mode		Supported			
ASR (Automatic Server Restart) setting for partitions	Supported				
I/O space allocation to I/O device			Supported		
Partition power control					
Power-on	Supported	Supported			
Power-off (shutdown)	Supported	Supported			
Reset	Supported	Supported			
NMI	Supported	Supported			
Forced power-off	Supported	Supported			
Diagnosis mode selection at power-on	Supported				
Scheduled operation	Supported				
OS boot settings					

Function	MMB Web-UI	MMB CLI	UEFI	PSA Web-UI	PSA CLI/ SVS CLI
OS boot device selection			Supported		
OS boot priority setting			Supported		
OS boot option setting			Supported		
OS boot delay time setting			Supported		
PXE boot network device setting			Supported		
Boot control (boot setting override)	Supported				
Partition operation tools					
Video redirection/remote storage	Supported				
Text console redirection	Supported				
UEFI shell			Supported		
Display of partition configuration information and partition status					
Partition status display (number of CPUs, memory size, power status)	Supported				
Partition information display (OS information)				Supported	
CPU				Supported	
DIMM				Supported	
PCI device				Supported	
Network interface				Supported	
Hard disk				Supported	
Configuration hardware list (hardware inventory)				Supported	
PSA monitoring log (agent log)				Supported	
Download of PSA acquisition configuration and PSA status (Export)				Supported	
Batch download of PSA logs				Supported	
MMB user account control					
MMB user account setting and display	Supported	Supported			
MMB login user display	Supported	Supported			
Server management network settings					
Setting of MMB date, time, and time zone	Supported	Supported			

Function	MMB Web-UI	MMB CLI	UEFI	PSA Web-UI	PSA CLI/ SVS CLI
MMB time synchronization (NTP) setting	Supported				
MMB management LAN setting	Supported	Supported			
LAN setting between PSA and MMB	Supported				Supported
Maintenance LAN setting	Supported	Supported			
MMB LAN port setting	Supported				
MMB network protocol setting	Supported	Supported			
SNMP setting	Supported	Supported			
SNMP setting (V3)	Supported				
SSL setting	Supported				
SSH setting	Supported	Supported			
Remote Server Management user setting (RMCP)	Supported				
Access control setting	Supported				
Alarm E-Mail setting	Supported				
MMB network status display command		Supported			
Maintenance					
Batch firmware update	Supported	Supported			
MMB configuration information save and restore	Supported				
BIOS configuration information save and restore	Supported				
Maintenance wizard: Component replacement	Supported				
Maintenance wizard: Maintenance mode setting and cancellation	Supported				
PCI card hot replacement and addition					Supported
HDD hot replacement and addition					Supported

A.3 Management Network Specifications

The following lists the management network specifications of the PRIMEQUEST 1000 series.

TABLE A.3 Management network specifications

Component (A)	Communication direction	Component (B)	USER port	CE port	REMCS port	Partition LAN port	Protocol (Port No.)	Port No.
Terminal software	Duplex	(MMB)	Used	Used	Not used	Not used	telnet (TCP 23)	Changeable
	Duplex						ssh (TCP 22)	Changeable
Video redirection	Duplex	MMB/ BMC	Used	Used	Not used	Not used	VNC (TCP 80)	
Remote storage	Duplex	MMB/ BMC	Used	Used	Not used	Not used	Remote Storage (TCP 5901)	
FST	Duplex	MMB	Used	Used	Not used	Not used	telnet (TCP 23)	Changeable
	Duplex						ssh (TCP 22)	Changeable
	Duplex						RMCP (UDP 623)	
REMCS Center	From B to A	MMB	Used	Used	Used	Not used	SMTP	Changeable
NTP server (clock device)	Duplex	MMB (client)	Used	Used	Not used	Not used	NTP (UDP 123)	
Web browser	Duplex	MMB/PSA	Used	Used	Not used	Not used	http/https (TCP 8081)	Changeable
SVOM	Duplex	(MMB)	Used	Used	Not used	Not used	telnet (TCP 23)	Changeable
	Duplex						ssh (TCP 22)	Changeable
	Duplex						snmp (UDP 161)	Changeable
	From B to A						snmp trap (UDP 162)	Changeable
	Duplex						RMCP (UDP 623)	
	Duplex	ServerView Agent	Not used	Not used	Not used	Used	snmp (UDP 161)	
	From B to A						snmp trap	

Component (A)	Communication direction	Component (B)	USER port	CE port	REMCS port	Partition LAN port	Protocol (Port No.)	Port No.
	Duplex						SERVERVIEW-RM (TCP/UDP 3172)	
	Duplex	PING	Used	Used	Not used	Used	ICMP	
	Duplex	SMTP Server	Not used	Not used	Not used	Used	SMTP (TCP/UDP 25)	
	Duplex	PostgreSQL DB	Not used	Not used	Not used	Used	PostgreSQL (TCP/UDP 9212)	
	Duplex	MS SQL DB	Not used	Not used	Not used	Used	MS-SQL-S (TCP/UDP 1433)	
							MS-SQL-M (TCP/UDP 1434)	
SVagent	Duplex	SVOM	Not used	Not used	Not used	Used	snmp (UDP 161)	
	From A to B	SVOM	Not used	Not used	Not used	Used	snmp trap	
	Duplex	SVOM	Not used	Not used	Not used	Used	SERVERVIEW-RM (TCP/UDP 3172)	
SVmco	Duplex	MMB	Not used	Not used	Not used	Used	RMCP (UDP 7000 to 7100)	
	From B to A	MMB	Not used	Not used	Not used	Used	SNMPTRAP (UDP 162)	
	Duplex	MMB	Not used	Not used	Not used	Used	SNMP (UDP 161)	
	Duplex	MMB	Not used	Not used	Not used	Used	(TCP 5000)	
	Duplex	MMB	Not used	Not used	Not used	Used	(icmp echo-request/echo-reply)	
SVIM	Duplex	PXE client	Not used	Not used	Not used	Used	DHCP (UDP 67)	
			Not used	Not used	Not used	Used	PXE (UDP 4011)	
			Not used	Not used	Not used	Used	tftp (UDP 69)	

APPENDIX B Physical Mounting Locations and Port Numbers

This appendix describes the physical mounting locations of components, and shows GSPB and MMB port numbers.

B.1 Physical Mounting Locations of Components 312
B.2 Port Numbers 313

B.1 Physical Mounting Locations of Components

This section describes the physical mounting locations of components.

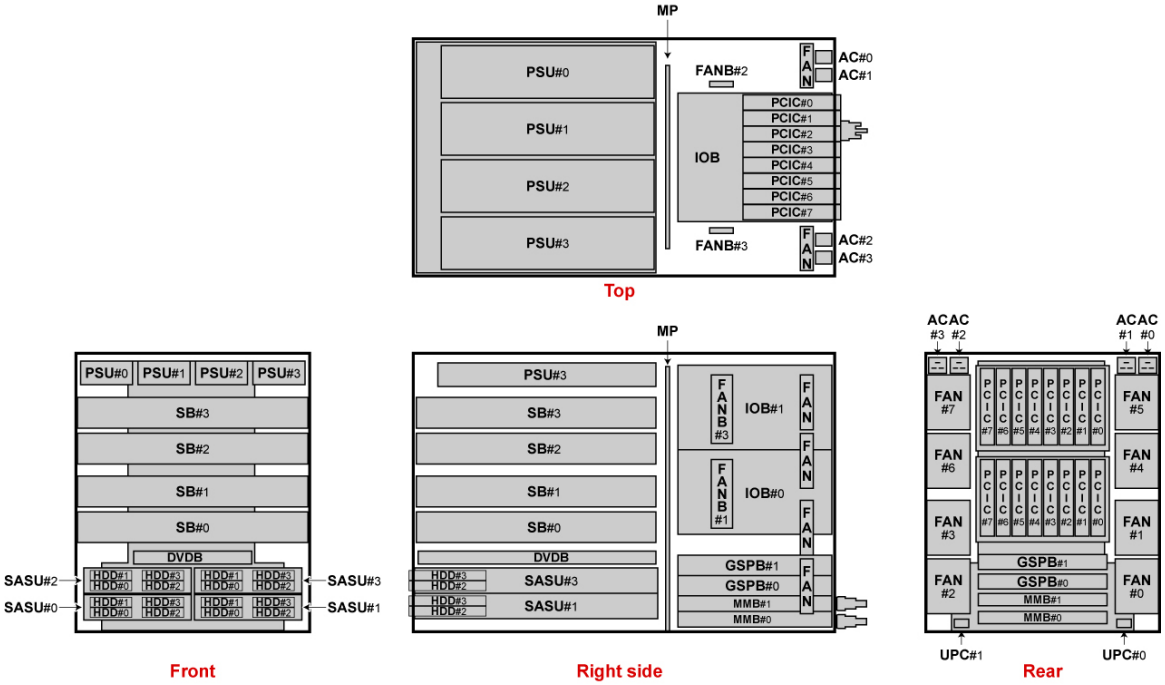


FIGURE B.1 Physical mounting locations in the PRIMEQUEST 1800E2/1800E

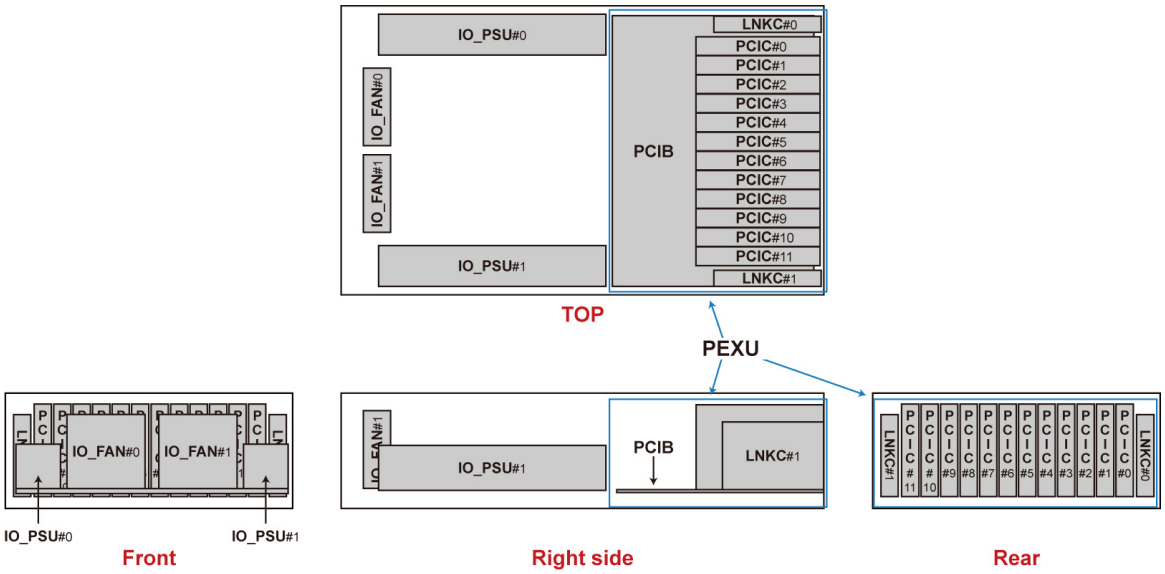


FIGURE B.2 Physical mounting locations in the PCI_Box

B.2 Port Numbers

This section shows the numbering policy of each GSPB and MMB port.

Remarks

The character strings used in numbering are the port numbers as viewed from firmware. These port numbers differ from the character strings in the port identification printed, stamped, or otherwise marked on units.

FIGURE B.3 GSPB port numbers shows GSPB port numbering. FIGURE B.4 MMB port numbers shows MMB port numbering. GbE#0 and GbE#1, GbE#2 and GbE#3, GbE#4 and GbE#5, and GbE#6 and GbE#7 are connected to the same respective LAN controllers.

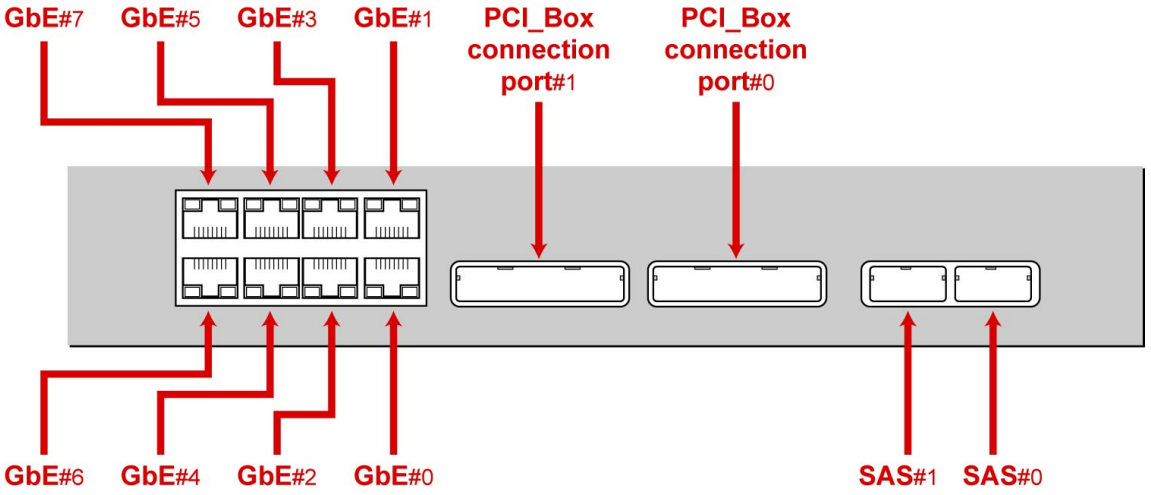


FIGURE B.3 GSPB port numbers

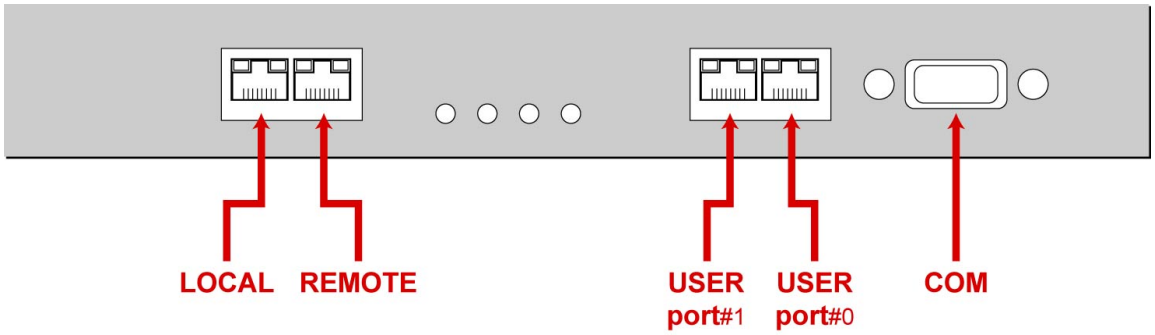


FIGURE B.4 MMB port numbers

APPENDIX C Lists of External Interfaces

This appendix describes the external interfaces of the PRIMEQUEST 1000 series.

C.1 List of External System Interfaces 316
C.2 List of External MMB Interfaces 317
C.3 List of Other External Interfaces 318

C.1 List of External System Interfaces

The following lists the external system interfaces.

TABLE C.1 External system interfaces

IOB interface	Number of ports	Mounting component	Remarks
USB	4	SB	USB 2.0
VGA	1	SB	Max.1600 × 1200 dots, 65536 colors
LAN (GSPB)	8	GSPB	1000Base-T
SAS	2	GSPB	
HDD	4	SAS disk unit/SAS array disk unit	2.5-inch HDD
DVD drive	1	DVDB	
PCI_Box interface	2	GSPB	PCI Express 2.0, 8-lane
PCI_Box interface (PCI_Box)	2	PCI_Box	PCI Express 2.0, 8-lane
PCI Express slot (onboard)	8	IOB	
PCI Express slot (PCI_Box)	12	PCI_Box	

C.2 List of External MMB Interfaces

The following lists the external MMB interfaces.

TABLE C.2 External MMB interfaces

External interface		Number of ports	Remarks
LAN (MMB)	1000Base-T	2	USER port (Management LAN)
	100Base-TX	1	Maintenance LAN port (LOCAL port)
	100Base-TX	1	REMCS port (REMOTE port)
COM		1	Connector type: D-Sub, 9 pin

C.3 List of Other External Interfaces

The following lists other external interfaces.

TABLE C.3 Other external interfaces

External interface	Number of ports	Remarks
UPC	2	Connector type: D-Sub, 9 pin

APPENDIX D Physical Locations and BUS Numbers of Built-in I/O, and PCI Slot Mounting Locations and Slot Numbers

This appendix shows the correspondence between the physical locations and BUS numbers of built-in I/O in the PRIMEQUEST 1000 series server. It also shows the correspondence between PCI slot mounting locations and slot numbers.

D.1 Physical Locations and BUS Numbers of Internal I/O Controllers of the PRIMEQUEST 1000 Series 320
D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers 321

D.1 Physical Locations and BUS Numbers of Internal I/O Controllers of the PRIMEQUEST 1000 Series

The following table shows the correspondence between SB internal I/O controllers and BUS numbers (BUS:DEV.FUNC).

TABLE D.1 Correspondence between physical locations of SB internal I/O controllers and BUS numbers

Internal I/O	BUS:DEV.FUNC	Remarks
HomeSB-USB UHCI controller	00:1A.0	USB 1.1 (used for video redirection)
	00:1D.0	Front #0, #1 USB 1.1
	00:1D.1	Front #2, #3 USB 1.1
HomeSB-USB EHCI controller	00:1A0.7	USB 2.0 (used for remote storage)
	00:1D.7	USB 2.0 (front USB ports #0 to #3 of the Home SB and USB ports for connecting the DVD drive with the built-in DVDB)

D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers

The following table shows the correspondence between PCI slot mounting locations and slot numbers.

TABLE D.2 Correspondence between PCI Slot Mounting Locations and Slot Numbers

Mounting location		Slot number (decimal number)
Board	Slot	PRIMEQUEST 1800E2/1800E
IOB#0	PCIC#0	0001
	PCIC#1	0002
	PCIC#2	0003
	PCIC#3	0004
	PCIC#4	0005
	PCIC#5	0006
	PCIC#6	0007
	PCIC#7	0008
IOB#1	PCIC#0	0017
	PCIC#1	0018
	PCIC#2	0019
	PCIC#3	0020
	PCIC#4	0021
	PCIC#5	0022
	PCIC#6	0023
	PCIC#7	0024
PCI_Box#0	PCIC#0	0033
	PCIC#1	0034
	PCIC#2	0035
	PCIC#3	0036
	PCIC#4	0037
	PCIC#5	0038
	PCIC#6	0039
	PCIC#7	0040
	PCIC#8	0041
	PCIC#9	0042
	PCIC#10	0043

Mounting location		Slot number (decimal number)
Board	Slot	PRIMEQUEST 1800E2/1800E
	PCIC#11	0044
PCI_Box#1	PCIC#0	0049
	PCIC#1	0050
	PCIC#2	0051
	PCIC#3	0052
	PCIC#4	0053
	PCIC#5	0054
	PCIC#6	0055
	PCIC#7	0056
	PCIC#8	0057
	PCIC#9	0058
	PCIC#10	0059
	PCIC#11	0060

N/A: Not applicable

APPENDIX E PRIMEQUEST 1000 Series Cabinets (Link)

For details on PRIMEQUEST 1000 series cabinets and components and PCI_Box cabinets and components, see Chapter 1 Installation Information in the *PRIMEQUEST 1000 Series Hardware Installation Manual* (C122-H004EN).

APPENDIX F Status Checks with LEDs

This appendix describes the types of mounted LEDs for the PRIMEQUEST 1000 series. It also describes how to check the status with LEDs.

F.1 LED Types 325
F.2 LED Mounting Locations 331
F.3 LED list 332

F.1 LED Types

The PRIMEQUEST 1000 series has functions using LEDS to indicate any problems, the power-on/off status, and the physical location of each component. You can check detailed status information on each component in the MMB Web-UI.
The Alarm LEDs of all components go on when the resident power supply is turned on, but this is not an error. Each Alarm LED goes out as the corresponding component is confirmed to be normal.

Each component comes equipped with the following LEDs:

- Power LED (green)
  This LED indicates the power status in the component.

- Alarm LED (orange)
  This LED indicates whether there is an error in the component.

- Location LED (blue)
  This LED indicates the mounting location of the component. The display function of the LED is helpful in replacement. The user can set this function to on or off.

This section describes the LEDs of each component.

F.1.1 Power LED, Alarm LED, and Location LED

In principle, each component for the PRIMEQUEST 1000 series comes equipped with the following LEDs.

TABLE F.1 Power LED, Alarm LED, and Location LED

LED type	Color	Function
Power	Green	Indicates the power status of the component.
Alarm	Orange	Indicates whether there is an error in the component.
Location	Blue	- Identifies the component (location). - Can be arbitrarily set to blink or turned off by the user. - Indicates the component undergoing maintenance when Maintenance Wizard is running.

F.1.2 Home LED

The SB comes equipped with the Home LED. This LED indicates the Home SB. The Home SB is the SB whose Home LED is on. The LED indicates whether the USB and VGA ports of the SB are enabled.

TABLE F.2 SB Home LED

LED type	Color	Function
Home	Green	- Indicates the Home SB. - Indicates the SB whose USB and VGA ports are enabled.

F.1.3 LAN

The LAN port comes equipped with the following LEDs.

TABLE F.3 LAN LEDs

LED type	Color	Function	Remarks
100M LAN Link/Act	Green	Indicates the Link status and Activity status of a 100M LAN.	Mounted only on the MMB
100M LAN Speed	Green	Indicates the communication speed of a 100M LAN.	Mounted only on the MMB
GbE LAN Link/Act	Green	Indicates the Link status and Activity status of a GbE LAN.	Mounted only on the MMB and GSPB
GbE LAN Speed	Green/Orange	Indicates the communication speed of a GbE LAN.	Mounted only on the MMB and GSPB

F.1.4 HDD

The HDD comes equipped with the following LEDs.

TABLE F.4 HDD LEDs

LED type	Color	Function
HDD Access	Green	Indicates the HDD access status.
HDD Alarm	Orange	Indicates whether there is an error in the HDD and the hot operation status.

TABLE F.5 HDD status and LED display

HDD status	HDD access	HDD alarm	Remarks
HDD being accessed	Blinking	Off	
HDD error	Off	On	

HDD status	HDD access	HDD alarm	Remarks
HDD location indicated	Off	(Regular) Blinking (fast)	When the SAS disk unit/SAS array disk unit is used
Array rebuild in progress (RAID)	Blinking	(Regular) Blinking (slow)	When the SAS array disk unit is used

F.1.5 PCI Express card slot

PCI Express card slots come equipped with the following LEDs. The LED display of PCI Express card slots conforms to PCI Express specifications.

TABLE F.6 PCI Express card slot LEDs

LED type	Color	Function
Power	Green	Indicates the power status of a PCI Express card slot.
Alarm	Orange	Indicates whether there is an error in a PCI Express card.

The following table lists the LED indications for each status of the PCI Express card. However, it shows only the LED indications to be noted for each status. (A blank space indicates that the LED can be on or blinking.)

TABLE F.7 PCI Express card status and LED display

PCI Express card status	Power	Alarm
In normal use	On	
PCI Express card problem detected		On

F.1.6 DVDB

The DVDB comes equipped with an LED indicating the status of the whole device, the MMB Ready LED, and the System Alarm LED. From the DVDB LED display, you can check the power status of the entire device, check for any problem, and check the MMB firmware status.

TABLE F.8 DVDB LEDs

LED type	Color	Function	Remarks
System Power	Green	Indicates the power status of the device.	
System Alarm	Orange	Indicates whether there is an error in the device.	For the front of the device

LED type	Color	Function	Remarks
CSS	Yellow	Function supported in future	Function supported in future
System Location (ID)	Blue	- Identifies the device/DVDB (location). - Can be arbitrarily turned on, set to blink, or turned off by the user.	For the front of the device For locating DVDB
MMB Ready	Green	Indicates the MMB status.	

The following table lists the LED indications for each status of the DVDB (device). However, it shows only the LED indications to be noted for each status. (A blank space indicates that the LED can be on or blinking.)

TABLE F.9 DVDB (device) status and LED display

DVDB status/device status	System Power	MMB Ready	System Alarm	ID
The power to any partition is on.	On (green)			
The MMB is being started.		Blinking		
The MMB is in the Ready status.		On		
A problem occurred in the device.			On	
The device is being located.				On or blinking

F.1.7 MMB

The MMB comes equipped with the Active LED and Ready LED. The Active LED indicates the active MMB, and the Ready LED indicates the MMB firmware status.
After the MMB firmware starts, the active MMB turns on the Active LED. The Ready LED blinks while MMB firmware startup is in progress. The Ready LED stays on when the startup is completed.

TABLE F.10 MMB LEDs

LED type	Color	Function
Ready	Green	- Indicates the MMB status. - Synchronizes with the MMB Ready LED of the DVDB.
Alarm	Orange	Indicates whether there is an error in the MMB.
Active	Green	Indicates whether the MMB is the active or standby MMB.
Location (ID)	Blue	Indicates the MMB location.

The following table lists the LED indications for each status of the MMB (device). However, it shows only the LED indications to be noted for each status. (A blank space indicates that the LED can be on or blinking.)

TABLE F.11 MMB (device) status and LED display

MMB status/device status	Ready	Active	Location (ID)	Alarm
MMB startup is in progress.	Blinking			
The MMB has started normally (Ready status).	On			
The MMB is the standby MMB.		Off		
The MMB is the active MMB.		On		
The MMB is being located.			On or blinking	
An error occurred in the MMB.				On

F.1.8 PSU

The PSU comes equipped with the following LED.

TABLE F.12 PSU LED

LED type	Color	Function
Power/Alarm	Green/Orange	Indicates whether there is AC input to each PSU, whether there is an error in the PSU, and the PSU on/off status.

TABLE F.13 Power status and PSU LED display

Status	Power/Alarm
PSU AC input is off.	Off
AC input is on, and the PSU is off.	Blinking in green
AC input is on, and the PSU is on.	On (green)
There is a PSU output error, and the PSU FAN stopped.	On (orange)
The AC input of the PSU is on, and the PSU is disconnected.	Off

F.1.9 IO_PSU

The IO_PSU comes equipped with the following LEDs.

TABLE F.14 IO_PSU LEDs

LED type	Color	Function	Remarks
AC	Green	Indicates whether there is AC input to the individual PSU.	IO_PSU control
DC	Green	Indicates the on/off status of each IO_PSU.	IO_PSU control
CHECK	Orange	Indicates whether there is an error in the PSU.	MMB-FW control

TABLE F.15 Power status and IO_PSU LED display

Status	AC	DC	CHECK
AC input to all IO_PSUs is off.	Off	Off	Off
AC input to this IO_PSU is off, and AC input to another IO_PSU is on.	Off	Off	Off
AC input is on, and the PSU is off (+5 V standby being output).	On	Off	Off
AC input is on, and the PSU is on (+5 V standby being output, +12 V being output).	On	On	Off
There is an IO_PSU output error (+5 V standby being output, +12 V output error).	On	Off	On
There is an IO_PSU output error (+5 V standby output error, +12 V being output).	Off	On	On
There is an IO_PSU output error (+5 V standby output error, +12 V output error).	Off	Off	On

F.2 LED Mounting Locations

This section describes the physical LED mounting locations on each component.

- Components equipped with Power, Alarm, and Location LEDs have the LEDs mounted as follows.
  - The order of mounted LEDs arranged from left to right is as follows: Power, Alarm, Location.
  - The order of mounted LEDs arranged from top to bottom is as follows: Power, Alarm, Location.
- From the standpoint of appearance, components equipped with LAN ports have the Speed LED on the left and the Link/Act LED on the right of each port.

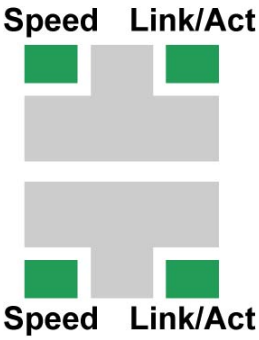


FIGURE F.1 LED mounting locations on components equipped with LAN ports

LEDs

- The order of MMB LEDs arranged from the left or the top is as follows: Ready, Alarm, Active, and Location.

FIGURE F.2 MMB LED mounting locations

- The order of System LEDs arranged from the left or the top is as follows: Power, Alarm, CSS, Location, MMB_Ready.

FIGURE F.3 System LED mounting locations

- The order of PCI_Box LEDs arranged from the left is as follows: IO_PSU, IO_FAN#0, IO_FAN#1, Power, Alarm, Location.

FIGURE F.4 PCI_Box LED mounting locations

F.3 LED list

The following table lists the mounted LEDs for the PRIMEQUEST 1000 series.

TABLE F.16 LEDs

Component		LED type	Color	Status	Description	
MMB	LAN 100BASE-TX (MMB)	Link/Act	Green	Off	Network not link	
				Blinking in green	Network active	
				On (green)	Network link	
		Speed	Green	Off	10Mbps	
				On (green)	100Mbps	
	LAN 1000BASE-TX (MMB)	Link/Act	Green	Off	Network not link	
				Blinking in green	Network active	
				On (green)	Network link	
		Speed	Green/Orange	Off	10Mbps	
				On (green)	100Mbps	
				On (orange)	1000Mbps	
GSPB	LAN 1000BASE-T	Link/Act	Green	Off	Network not link	
				Blinking in green	Network active	
				On (green)	Network link	
		Speed	Green/Orange	Off	10Mbps	
				On (green)	100Mbps	
				On (orange)	1000Mbps	
SAS disk unit/ SAS array disk unit	HDD	Access	Green	Off	Not Active	
				Blinking	Active	
		Alarm	Orange	Off	HDD normal	
				On	Error at HDD Hot removal possible	
				Blinking	Fast	Location indicated
					Slow	Array rebuild in progress (RAID)

Component		LED type	Color	Status	Description
PCI_Box	PCI Express card slot	Power	Green	Off	PCI Express slot power off
				Blinking	PCI Express hot replacement in progress
				On	PCI Express slot power on
		Alarm	Orange	Off	PCI Express slot normal
				Blinking	PCI Express slot location
				On	Error at PCI Express slot
IOB	PCI Express card slot	Power	Green	Off	PCI Express slot power off
				Blinking	PCI Express hot replacement in progress
				On	PCI Express slot power on
		Alarm	Orange	Off	PCI Express slot normal
				Blinking	PCI Express slot location
				On	Error at PCI Express slot
DVDB		System Power	Green	Off	Power off in all partitions
				On	- Power on in all partitions - PSU on, 12V feed
		System Alarm	Orange	On	Error occurrence in cabinet
		CSS	Yellow	On	Function supported in future
				Blinking	Function supported in future
		System Location (ID)	Blue	On or Blinking	Cabinet location
		MMB Ready	Green	Off	MMB not initialized
				Blinking	MMB initialization in progress
				On	MMB initialization complete (normal MMB operating status)
DVDB	DVD drive	Access	Orange	Off	Not Active
				Blinking	Active
MMB		Location	Blue	On or Blinking	Component location
		Ready	Green	Off	MMB not initialized
				Blinking	MMB initialization in progress
				On	MMB initialization complete (normal MMB operating status)
		Active	Green	Blinking in green	Active MMB location

Component		LED type	Color	Status	Description
		Location	Blue	On or Blinking	Error occurrence in component location
PSU		Power/Alarm	Green/Orange	Off	PSU AC input off
				Blinking in green	PSU AC input on, PSU off
				On (green)	PSU AC input on, PSU on
				On (orange)	Error at PSU
PCI_Box	IO_PSU	AC	Green	Off	AC off or 5V SB output stopped
				On	AC on or 5V SB being output
		DC	Green	Off	12V output stopped
				On	12V being output
		CHECK	Orange	Off	IO_PSU normal
				On	Error at IO_PSU
FAN		Alarm	Orange	Off	FAN normal
				On	Error at FAN
SB		Power	Green	Off	SB power off
				On	SB power on
		Alarm	Orange	Off	SB normal
				On	Error in SB
		Home	Green	Off	Invalid USB or VGA port in SB
				On	Home SB location. Valid USB or VGA port in SB
IOB		Power	Green	Off	IOB power off
				On	IOB power on
		Alarm	Orange	Off	IOB normal
				On	Error in IOB
		Location	Blue	On or Blinking	Component location
GSPB		Power	Green	Off	GSPB power off
				On	GSPB power on
		Alarm	Orange	Off	GSPB normal
				On	Error in GSPB
		Location	Blue	On or Blinking	Component location
SAS disk unit/SAS array disk unit		Power	Green	Off	SAS disk unit/SAS array disk unit power off

Component		LED type	Color	Status	Description
				On	SAS disk unit/SAS array disk unit power on
		Alarm	Orange	Off	SAS disk unit/SAS array disk unit normal
				On	Error in SAS disk unit/SAS array disk unit
		Location	Blue	On or Blinking	Component location
PCI_Box		Power	Green	Off	PCI_Box power off
				On	PCI_Box power on
		Alarm	Orange	Off	PCI_Box normal
				On	Error in PCI_Box
		Location	Blue	Off	-
				On or Blinking	Component location
		IO_PSU_ CHECK (*1)	Orange	Off	IO_PSU normal
				Blinking	Error in IO_PSU
PCI_Box	IO_FAN	Alarm	Orange	Off	IO_FAN normal
				On	Error in IO_ FAN

*1 OR output of two IO_PSU CHECK LEDs (If the CHECK LED of even one IO_PSU goes on, the IO_PSU_CHECK LED goes on.)

APPENDIX G Component Mounting Conditions

This appendix describes the mounting conditions of components for the PRIMEQUEST 1000 series.

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G.1 CPU

This section describes the number of CPUs that can be mounted and the criteria for mixing different types of CPU.

Notes

- A single cabinet or partition cannot contain both a CPU belonging to the Intel Xeon 7500 series and a CPU belonging to the Intel Xeon E7 family.
- A single cabinet can contain CPUs that have different frequencies, cache sizes, and numbers of cores.
  A single partition can contain only completely identical CPUs, which for example have the same frequency, cache size, number of cores, power consumption, QPI, and scale.
- When the hyper-threading function of the CPU is enabled, the number of CPUs recognized by the operating system is doubled. The number of logical CPUs that can be installed in a partition depends on the operating system used (i.e., Windows/RHEL version and x64/x86 version).
- When replacing CPUs, even if the replacement CPU is of the same generation, firmware update is required if the CPU version number is different.
- You can set the x2APIC mode in the PRIMEQUEST 1800E2. Set Enabled or Disabled for x2APIC mode according to the operating system. If the operating system does not support x2APIC, set [Disable] for x2APIC from the UEFI. If the operating system supports x2APIC, set [Enable]. The following table shows which operating systems support x2APIC.

TABLE G.1 x2APIC support of each operating system (PRIMEQUEST 1800E2)

OS	x2APIC setting
Windows Server 2008	Disabled (*2)
Windows Server 2008 R2	Enabled (for SP1 and later) (*1) Disabled (no SP applied) (*2)
Windows Server 2012	Enabled
RHEL5	Disabled
RHEL6 (for Intel64)	Enabled
RHEL6 (for Intel86)	Disabled
ESX 4.x	Disabled
ESXi 5.x	Enabled
Hyper-V	Disabled
Xen	Disabled
KVM	Enabled

*1: In Windows Server 2008 R2 SP1, x2APIC must be [Disable] if Hyper-V is used.
*2: x2APIC must be [Enable] if SVIM V10.11.08 or later is used.

CPU mounting criteria

- In a partition configured with one SB, only one CPU can be mounted on the SB. (*)
- In a partition configured with multiple SBs, two CPUs must be mounted on the SB. (*)
- CPUs must be mounted starting from CPU#0 on the SB.

- An SB with no CPU mounted on it will cause an error.

* 1800E2/1800E only

The following lists the number of SBs and CPUs per partition for each model. In a partition with only one SB installed, the SB can have one or two CPUs mounted.

TABLE G.2 Numbers of SBs and CPUs per partition

Partition configuration	PRIMEQUEST 1800E2/1800E
1 SB	1
1 SB	2
2 SB	N/A
2 SB	N/A
2 SB	4
3 SB	6
4 SB	8

* Only supported for degraded CPUs in a configuration with 2 SBs/4 CPUs or more
N/A: Not applicable

An SB with only one CPU mounted is protected by the MMB firmware (Web-UI) such that the SB cannot configure a partition that uses multiple SBs. The protection function only works with the number of CPUs and takes into account unsupported CPUs and CPUs degraded by a hardware failure.

G.2 DIMM

This section describes the number of DIMMs that can be mounted and the criteria for mixing different types of DIMM.

Notes

- The maximum memory size recognized by the operating system depends on the operating system type. For details, see the respective operating system manuals.
  For details on the maximum memory capacity in Windows operating systems, contact your sales representative or a field engineer.
- When the Memory Mirror function is used, the memory size recognized by the operating system is half the mounted memory size.
  The maximum memory size recognized depends on the operating system type.
  Example: If 16 GB of DIMM is installed and the Memory Mirror function is used, the operating system recognizes 8 GB of memory.
- If the CPU is degraded, memory is also degraded.

DIMM mounting conditions

- At least four DIMMs are required per CPU.
- Up to 16 DIMMs can be mounted per CPU.
- If a single CPU is mounted on the SB, the maximum number of DIMMs that can be mounted is 16.
- DIMMs must be mounted in the following units (for all models):
  - Units of four DIMMs when Mirror mode is disabled
  - Units of eight DIMMs when Mirror mode is enabled

DIMM mixing criteria

- 2 GB and 4 GB DIMMs can be mounted in a single SB or partition.
- 8 GB/16 GB/32 GB DIMMs cannot be mixed with DIMMs of other sizes in an SB or partition.
- Identical DIMMs means those with the same size.

TABLE G.3 Relationship between DIMM size and mutual operability (within an SB)

DIMM size	2 GB	4 GB	8 GB	16 GB	32 GB
2 GB	Supported	Supported	Not supported	Not supported	Not supported
4 GB	Supported	Supported	Not supported	Not supported	Not supported
8 GB	Not supported	Not supported	Supported	Not supported	Not supported
16 GB	Not supported	Not supported	Not supported	Supported	Not supported
32 GB	Not supported	Not supported	Not supported	Not supported	Supported

TABLE G.4 Relationship between DIMM size and mutual operability (within a partition)

DIMM size	2 GB	4 GB	8 GB	16 GB	32 GB
2 GB	Supported	Supported	Not supported	Not supported	Not supported

DIMM size	2 GB	4 GB	8 GB	16 GB	32 GB
4 GB	Supported	Supported	Not supported	Not supported	Not supported
8 GB	Not supported	Not supported	Supported	Not supported	Not supported
16 GB	Not supported	Not supported	Not supported	Supported	Not supported
32 GB	Not supported	Not supported	Not supported	Not supported	Supported

TABLE G.5 Relationship between DIMM size and mutual operability (within a cabinet)

DIMM size	2 GB	4 GB	8 GB	16 GB	32 GB
2 GB	Supported	Supported	Supported	Supported	Supported
4 GB	Supported	Supported	Supported	Supported	Supported
8 GB	Supported	Supported	Supported	Supported	Supported
16 GB	Supported	Supported	Supported	Supported	Supported
32 GB	Supported	Supported	Supported	Supported	Supported

Within each of the following DIMM groups, identical DIMMs must be mounted.

TABLE G.6 Identical DIMM groups

Group	DIMM number
1	0A0, 0B0, 0C0, 0D0, 0A1, 0B1, 0C1, 0D1
2	1A0, 1B0, 1C0, 1D0, 1A1, 1B1, 1C1, 1D1
3	0A2, 0B2, 0C2, 0D2, 0A3, 0B3, 0C3, 0D3
4	1A2, 1B2, 1C2, 1D2, 1A3, 1B3, 1C3, 1D3

DIMM mounting locations

Among DIMMs with the same first and second digits in the DIMM slot numbers, first mount the DIMMs whose third digit is "0" or "2."

Example: If you mount #0A1, #0B1, #0C1, and #0D1 DIMMs (sequence 3) without mounting #0A0, #0B0, #0C0, and #0D0 DIMMs (sequence 1), the partition cannot be started.

G.2.1 DIMM mounting sequence

The sequence for adding DIMMs depends on the number of CPUs on the SB and whether or not the Memory Mirror function is used.

The following table lists the sequence for adding DIMMs as well as the slot locations.

TABLE G.7 Mounting sequence of DIMMs where a single CPU is mounted on an SB

Order	No mirroring	Mirroring
1	0A0, 0B0, 0C0, 0D0	0A0, 0B0, 0C0, 0D0, 0A2, 0B2, 0C2, 0D2
2	0A2, 0B2, 0C2, 0D2	0A1, 0B1, 0C1, 0D1, 0A3, 0B3, 0C3, 0D3
3	0A1, 0B1, 0C1, 0D1	N/A
4	0A3, 0B3, 0C3, 0D3	N/A

N/A: Not applicable

TABLE G.8 Mounting sequence of DIMMs where two CPUs are mounted on an SB

Order	No mirroring	Mirroring
1	0A0, 0B0, 0C0, 0D0, 1A0, 1B0, 1C0, 1D0	0A0, 0B0, 0C0, 0D0, 1A0, 1B0, 1C0, 1D0
2	0A2, 0B2, 0C2, 0D2	0A2, 0B2, 0C2, 0D2, 1A2, 1B2, 1C2, 1D2
3	1A2, 1B2, 1C2, 1D2	0A1, 0B1, 0C1, 0D1, 1A1, 1B1, 1C1, 1D1
4	0A1, 0B1, 0C1, 0D1	0A3, 0B3, 0C3, 0D3, 1A3, 1B3, 1C3, 1D3
5	1A1, 1B1, 1C1, 1D1	N/A
6	0A3, 0B3, 0C3, 0D3	N/A
7	1A3, 1B3, 1C3, 1D3	N/A

N/A: Not applicable

G.2.2 DIMM mounting patterns

This section shows mounting patterns that satisfy both of the above-described DIMM mixing criteria and DIMM mounting sequence.
The mounting pattern is determined by the number of CPUs on the SB and whether or not the Memory Mirror function is used.

TABLE G.9 DIMM mounting pattern

CPU#/ SB	Mirror mode	Mounting pattern
1	No mirroring	Pattern 1

CPU#/ SB	Mirror mode	Mounting pattern
2	Mirroring	Pattern 2
	No mirroring	Pattern 3
	Mirroring	Pattern 4

The following tables list details of each pattern (patterns 1 to 4).
Each of the letters W, X, Y, and Z in the table represents an identical DIMM. The same type of DIMM must be mounted at locations with the same letter. Either an identical DIMM or different DIMM can be mounted at a location with a different letter.

TABLE G.10 DIMM mounting pattern 1

DIMM slot number	4 (*)	8 (*)	12 (*)	16 (*)
0A0	W	W	W	W
0A1	N/A	N/A	W	W
0A2	N/A	X	X	X
0A3	N/A	N/A	N/A	X
0B0	W	W	W	W
0B1	N/A	N/A	W	W
0B2	N/A	X	X	X
0B3	N/A	N/A	N/A	X
0C0	W	W	W	W
0C1	N/A	N/A	W	W
0C2	N/A	X	X	X
0C3	N/A	N/A	N/A	X
0D0	W	W	W	W
0D1	N/A	N/A	W	W
0D2	N/A	X	X	X
0D3	N/A	N/A	N/A	X

* The figure in the column header is the number of DIMMs mounted on the SB.
N/A: Not applicable

TABLE G.11 DIMM mounting pattern 2

DIMM slot number	8 (*)	16 (*)
0A0	W	W

DIMM slot number	8 (*)	16 (*)
0A1	N/A	W
0A2	W	W
0A3	N/A	W
0B0	W	W
0B1	N/A	W
0B2	W	W
0B3	N/A	W
0C0	W	W
0C1	N/A	W
0C2	W	W
0C3	N/A	W
0D0	W	W
0D1	N/A	W
0D2	W	W
0D3	N/A	W

* The figure in the column header is the number of DIMMs mounted on the SB.
N/A: Not applicable

TABLE G.12 DIMM mounting pattern 3

DIMM slot number	8 (*)	12 (*)	16 (*)	20 (*)	24 (*)	28 (*)	32 (*)
0A0	W	W	W	W	W	W	W
0A1	N/A	N/A	N/A	W	W	W	W
0A2	N/A	X	X	X	X	X	X
0A3	N/A	N/A	N/A	N/A	N/A	X	X
0B0	W	W	W	W	W	W	W
0B1	N/A	N/A	N/A	W	W	W	W
0B2	N/A	X	X	X	X	X	X
0B3	N/A	N/A	N/A	N/A	N/A	X	X
0C0	W	W	W	W	W	W	W
0C1	N/A	N/A	N/A	W	W	W	W
0C2	N/A	X	X	X	X	X	X
0C3	N/A	N/A	N/A	N/A	N/A	X	X
0D0	W	W	W	W	W	W	W

DIMM slot number	8 (*)	12 (*)	16 (*)	20 (*)	24 (*)	28 (*)	32 (*)
0D1	N/A	N/A	N/A	W	W	W	W
0D2	N/A	X	X	X	X	X	X
0D3	N/A	N/A	N/A	N/A	N/A	X	X
1A0	Y	Y	Y	Y	Y	Y	Y
1A1	N/A	N/A	N/A	N/A	Y	Y	Y
1A2	N/A	N/A	Z	Z	Z	Z	Z
1A3	N/A	N/A	N/A	N/A	N/A	N/A	Z
1B0	Y	Y	Y	Y	Y	Y	Y
1B1	N/A	N/A	N/A	N/A	Y	Y	Y
1B2	N/A	N/A	Z	Z	Z	Z	Z
1B3	N/A	N/A	N/A	N/A	N/A	N/A	Z
1C0	Y	Y	Y	Y	Y	Y	Y
1C1	N/A	N/A	N/A	N/A	Y	Y	Y
1C2	N/A	N/A	Z	Z	Z	Z	Z
1C3	N/A	N/A	N/A	N/A	N/A	N/A	Z
1D0	Y	Y	Y	Y	Y	Y	Y
1D1	N/A	N/A	N/A	N/A	Y	Y	Y
1D2	N/A	N/A	Z	Z	Z	Z	Z
1D3	N/A	N/A	N/A	N/A	N/A	N/A	Z

* The figure in the column header is the number of DIMMs mounted on the SB.
N/A: Not applicable

TABLE G.13 DIMM mounting pattern 4

DIMM slot number	8 (*)	16 (*)	24 (*)	32 (*)
0A0	W	W	W	W
0A1	N/A	N/A	W	W
0A2	N/A	X	X	X
0A3	N/A	N/A	N/A	X
0B0	W	W	W	W
0B1	N/A	N/A	W	W
0B2	N/A	X	X	X
0B3	N/A	N/A	N/A	X
0C0	W	W	W	W

DIMM slot number	8 (*)	16 (*)	24 (*)	32 (*)
0C1	N/A	N/A	W	W
0C2	N/A	X	X	X
0C3	N/A	N/A	N/A	X
0D0	W	W	W	W
0D1	N/A	N/A	W	W
0D2	N/A	X	X	X
0D3	N/A	N/A	N/A	X
1A0	W	W	W	W
1A1	N/A	N/A	W	W
1A2	N/A	X	X	X
1A3	N/A	N/A	N/A	X
1B0	W	W	W	W
1B1	N/A	N/A	W	W
1B2	N/A	X	X	X
1B3	N/A	N/A	N/A	X
1C0	W	W	W	W
1C1	N/A	N/A	W	W
1C2	N/A	X	X	X
1C3	N/A	N/A	N/A	X
1D0	W	W	W	W
1D1	N/A	N/A	W	W
1D2	N/A	X	X	X
1D3	N/A	N/A	N/A	X

* The figure in the column header is the number of DIMMs mounted on the SB.

N/A: Not applicable

G.3 PCI Card Mounting Conditions and Available Internal I/O

This section describes the PCI card mounting criteria and available internal I/O ports in the PRIMEQUEST 1000 series server.

Remarks

Up to 16 devices can be allocated to the I/O space. Note that the PCI Express switch occupies one PCI-to-PCI bridge per slot. For details on I/O space allocation, see 5.5 [Device Manager] Menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN).

G.3.1 Available internal I/O ports

The following table lists the number of available internal I/O ports.

TABLE G.14 Available internal I/O ports and the quantities

Internal I/O		No.	Remarks
SB	USB	4	Home SB only
	VGA	1	
SAS disk unit/ SAS array disk unit	Internal HDD	4	
GSPB	GbE	8	
	SAS	2	

The internal I/O ports are hidden behind the front bezel. Remove the front bezel to access them.

G.4 Legacy BIOS Compatibility (CSM)

The PRIMEQUEST 1000 series uses the UEFI, which is firmware that provides the BIOS emulation function. Currently, the following legacy BIOS restrictions are known:

- Option ROM area restriction: The number of PXE-enabled cards that can operate as boot devices is restricted to four.
- I/O space restriction: In a legacy BIOS environment, I/O space is required on a boot device.

Note

In a CSM environment, I/O space must be allocated to a boot device.

G.5 Rack Mounting

For details on installation in a 19-inch rack, see the *PRIMEQUEST 1000 Series Hardware Installation Manual* (C122-H004EN).

G.6 Installation Environment

For details on the environmental conditions for PRIMEQUEST 1000 series installations, see the *PRIMEQUEST 1000 Series Hardware Installation Manual* (C122-H004EN).

G.7 SAS array disk unit

This section provides notes on using the SAS array disk unit.

Note

When starting the WebBIOS of the RAID controller with an SAS array disk unit, you cannot use text console redirection.

After terminating the WebBIOS or after rebooting or powering on/off the partition, make the connection and then use text console redirection.

For details on how to use the WebBIOS, see the *MegaRAID SAS Software*, the *MegaRAID SAS Device Driver Installation*, and the *Modular RAID Controller Installation Guide*.

G.8 NIC (Network Interface Card)

Note the following precautions on mounting of a NIC (network interface card).

Notes

- We recommend specifying the members of teaming between LANs of the same type.
  (We recommend teaming between cards of the same type in the onboard LAN.)
- If the teaming is specified with different types of LAN, the scaling function on the receive side may be off because of differences in the scaling function.
  Consequently, the balance of receive traffic may not be optimized, but this is not a problem for normal operation.
- Depending on the Intel PROSet version used at the time of teaming configuration, a warning may be output about scaling on the receive side being disabled for the above-described reasons. In this event, simply click the [OK] button.
  For details on the scaling function on the receive side or other precautions, see the help for Intel PROSet or check the information at [Device Manager] - [Properties *of the target LAN*] - [Details] - [Receive-Side Scaling].
- For the WOL (Wake on LAN) support conditions of operating systems, see the respective operating system manuals and restrictions. For remote power control in an operating system that does not support WOL, perform operations from the MMB Web-UI.

APPENDIX H Tree Structure of the MIB Provided with the PRIMEQUEST 1000 Series

This appendix describes the tree structure of the MIB provided with the PRIMEQUEST 1000 series.
For details on the MIB tree of SVS, see the MIB file of SVS.

H.1 MIB Tree Structure 354
H.2 MIB File Contents 356

H.1 MIB Tree Structure

MIB information under "mmb(1)" is provided by the MMB firmware. You can acquire it by accessing the MMB. You can also acquire the standard MIB information from the MMB.
In contrast, MIB information under "partition(2)" is provided by PSA. You can acquire it via the MMB by accessing the MMB, or you can acquire it directly from SNMP Service on the partition.
The MIB information in "partition(2)" is provided for each partition. If you acquired the MIB via the MMB, you can acquire information for each partition. To do so, request the OID after replacing the "partitionCommon(100)" values with each partition ID.

Note

The PRIMEQUEST 1000 series uses the SNMP function of the MMB to recognize changes in the partition state when each partition is started or stopped. For an MIB request received at this time from an external manager (e.g., Systemwalker Centric Manager), the MMB temporarily returns an error or time-out is temporarily returned. In this case, information can be obtained by reissuing the MIB request.

The following shows the MIB tree structure.

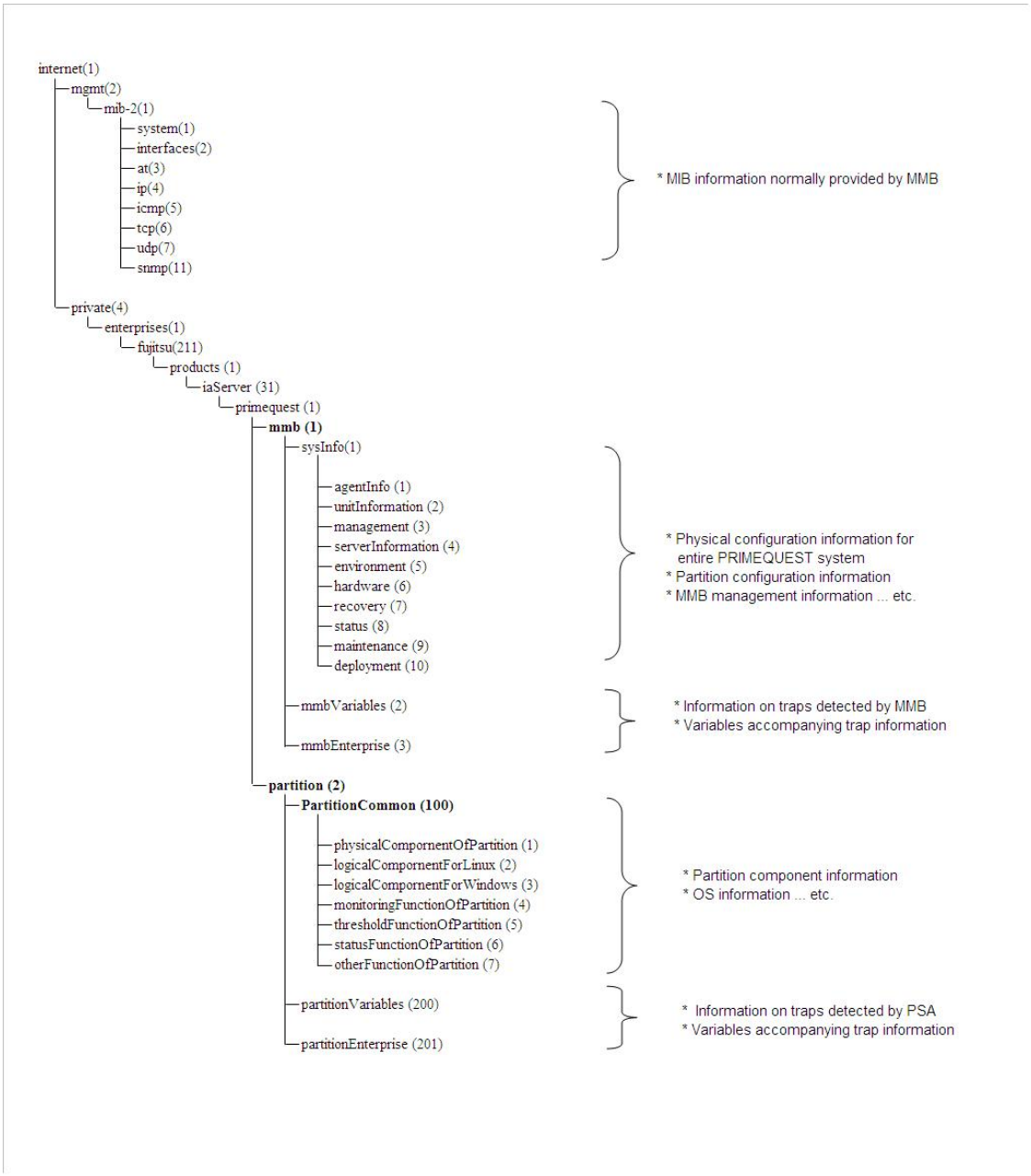

FIGURE H.1 MIB tree structure

Note

MIB information under "partition(2)" is provided only with the PRIMEQUEST 1800E.

Remarks

1. In the above MIB tree, ios(1).org(3).dod(6) is omitted before internet(1).
2. The above MIB tree omits detailed MIB information defined at the branches.
3. For details, see the MIB file (stored on the ServerView Suite DVD).

H.2 MIB File Contents

The following table lists the contents of MIB files.

Remarks

PSA-MIBs/ is provided only with the PRIMEQUEST 1800E.

TABLE H.1 MIB file contents

	MIB file	Purpose	Partition operating system	Information source	Description
MMB-MIBs/	MMB-COM-MIB.txt	Reference	-	MMB firmware	MIB information such as the hardware configuration of the entire cabinet
	MMB-ComTrap-MIB.txt	Monitoring	-		MIB information for hardware failure monitoring across the entire cabinet (MMB SEL event)
PSA-MIBs/	PSA-COM-MIB.txt	Reference	Linux/ Windows	PSA	MIB information on the hardware configuration including PCI cards belonging to the partition
	PSA-LIN-MIB.txt		Linux		MIB information such as Linux operating system information
	PSA-WIN-MIB.txt		Windows		MIB information such as Windows operating system information
	PSA-ComTrap-MIB.txt	Monitoring	Linux/ Windows	PSA	MIB information for monitoring S.M.A.R.T. events/RAID battery life
	PSA-SVAgentsTrap-MIB.txt		Linux/ Windows		MIB information for monitoring ServerView Agent events (JX40-related only)
	PSA-LinIntelE1000Trap-MIB.txt		Linux		MIB information for monitoring LAN card events
	PSA-LinIntelE1000ETrap-MIB.txt		Linux		
	PSA-LinIntelIgbTrap-MIB.txt		Linux		

	MIB file	Purpose	Partition operating system	Information source	Description
	PSA-LinIntelixgbeTrap-MIB.txt		Linux		
	PSA-LinEmulexTrap-MIB.txt		Linux		MIB information for monitoring FC card events
	PSA-LinLsiLogicTrap-MIB.txt		Linux		MIB information for monitoring SAS card events
	PSA-LinScsiComTrap-MIB.txt		Linux		MIB information for monitoring SAS device (disk, tape unit, etc.) events
	PSA-LinGrmpdTrap-MIB.txt		Linux		MIB information for monitoring MPD detection events
	PSA-LinGdsTrap-MIB.txt		Linux		MIB information for monitoring GDS detection events
	PSA-LinGlsTrap-MIB.txt		Linux		MIB information for monitoring GLS detection events
	PSA-LinSvsRaidTrap-MIB.txt		Linux		MIB information for monitoring ServerView RAID events
	PSA-WinIntelE1000expTrap-MIB.txt		Windows		MIB information for monitoring LAN card events
	PSA-WinIntele1expressTrap-MIB.txt		Windows		
	PSA-WinIntelixgbnTrap-MIB.txt		Windows		
	PSA-WinEmulexTrap-MIB.txt		Windows		MIB information for monitoring FC card events
	PSA-WinLsiLogicTrap-MIB.txt		Windows		MIB information for monitoring SAS card events

	MIB file	Purpose	Partition operating system	Information source	Description
	PSA-WinDiskTrap-MIB.txt		Windows		MIB information for monitoring disk events
	PSA-WinMpdTrap-MIB.txt		Windows		MIB information for monitoring MPD detection events
	PSA-WinGlsTrap-MIB.txt		Windows		MIB information for monitoring GLS detection events
	PSA-WinSvsRaidTrap-MIB.txt		Windows		MIB information for monitoring ServerView RAID events

APPENDIX I Windows Shutdown Settings

This appendix describes how to set (arbitrarily) Windows to shut down.

I.1 Shutdown from MMB Web-UI 360

I.1 Shutdown from MMB Web-UI

Windows shutdown from the MMB Web-UI requires ServerView Agent.

For details on how to set ServerView Agent, contact the distributor where you purchased your product or your sales representative.

APPENDIX J Systemwalker Centric Manager Linkage

This appendix describes linkage with Systemwalker Centric Manager.

J.1 Preparation for Systemwalker Centric Manager Linkage 362
J.2 Configuring Systemwalker Centric Manager linkage 363

J.1 Preparation for Systemwalker Centric Manager Linkage

Systemwalker Centric Manager is an application for intensive system and network management according to the life cycle of system deployment.
This section describes preparation for configuration of monitoring by the PRIMEQUEST 1000 series server in linkage with Systemwalker Centric Manager (referred to below as Systemwalker).
Prepare the following files and tools in advance.

TABLE J.1 Files and tools to prepare

Item to prepare	Source	Remarks
Extended MIB file (for traps)	DVD-ROM disk supplied with device	/SVSLocalTools/Japanese/PSA/ - MMB-ComTrap-MIB.txt
TrapMSG conversion definition file	DVD-ROM disk supplied with device	/SVSLocalTools/Japanese/PSA/ - mmbComTrap.cnf
SNMP trap conversion definition application command	Systemwalker installation directory	Execute the command on the Windows operations management server: (*1)
		Execute the command on the Linux/Solaris operations management server: (*2)
Menu registration command	Systemwalker installation directory	[install-dir]\mpwalker.dm\bin\mpaplreg.exe (Execute the command on an operations management client (*3).)
Filtering definition template	Systemwalker technical information *4	

(*1) Execute the command on the Windows operations management server:
[install-dir]\MpWalker.dm\MpCNappl\MpCNmgr\bin\CNSetCnfMg.exe

(*2) Execute the command on the Linux/Solaris operations management server:
/opt/FJSVfwntc/MpCNmgr/bin/CNSetCnfMg.exe

(*3) Systemwalker Centric Manager implements hierarchical operations management to ensure efficient management. The operations management client is one application.
For details, contact your sales representative or a field engineer.

(*4) For details on the Systemwalker technical information, contact your sales representative or a field engineer.

J.2 Configuring Systemwalker Centric Manager linkage

This section describes how to configure Systemwalker linkage with various settings.

- MMB node registration
- SNMP trap linkage
- Event monitoring linkage
- GUI linkage
- PRIMEQUEST 1000 series rack grouping linkage
- Linkage with ServerView Suite

J.2.1 MMB node registration

The MMB monitors the hardware of the entire rack. The MMB can be duplicated (optional) so that monitoring can continue even if it fails.
For monitoring by duplicate MMBs in the PRIMEQUEST 1000 series server with Systemwalker, be sure to register two MMB nodes and monitor these two nodes.
This section provides an overview of MMB node registration and describes how to register the MMB nodes for the PRIMEQUEST 1000 series.

For a dual MMB configuration

After registering an MMB node on the Systemwalker console, you can monitor problem events (SNMP traps from the MMB) of the PRIMEQUEST 1000 series hardware. For duplicate MMBs, register two MMB nodes to monitor each MMB for SNMP trap occurrence separately from the other MMB.
The MMB node registration procedure is as follows.

1. In the Systemwalker console window, select [Edit] from the functions that can be selected. The node list tree appears.

2. Select the network folder containing the MMB. Then, select [Object] - [Create Node] from the menu bar. If the network folder has not yet been created, create it before performing this operation.

3. For the node properties, enter the required items such as the display name and host name. For an operations management server (PRIMEQUEST 1000 series) running Linux, click [Basic Information] - [Add]. Then, select the MMB from the list. In addition, click [Interface] - [Add] to register the physical IP address of the active MMB.

4. For duplicate MMBs, also register the standby MMB. Select [Object] - [Create Node] again. For an operations management server (PRIMEQUEST 1000 series) running Linux, add the MMB for each machine type.
   For the interface, register the physical IP address of the standby MMB.

5. The registered node appears as an MMB icon on the Systemwalker console.

For details on the MMB node registration procedure and notes on when MMB switching occurs because of an MMB failure, see the *Systemwalker Centric Manager PRIMERGY/PRIMEQUEST Administration Guide*.

Remarks

- For an operations management server (PRIMERGY) whose operating system is Windows, the Solaris OS, or Linux, the MMB icon will not appear, though there is no problem with monitoring.
- When the MMB node has been registered through detection, the following phenomena may occur.
  - The virtual IP address of the MMB is recognized as an independent node and registered as a separate node from the physical IP address.
  - The representative interface of the node is registered not with the physical IP address of the MMB but with its virtual IP address.
  - The node icon represents a general computer, not the MMB.
    In these cases, delete the node and/or change the properties to change the machine type to MMB and the representative interface to the physical IP address. Then, select [Policy] - [Distribute Policy]. In the [Distribute Policy] window, select [Apply Immediately]. Then, click the [OK] button.

For a single MMB configuration

After registering an MMB node on the Systemwalker console, you can monitor problem events (SNMP traps from the MMB) of the PRIMEQUEST 1000 series hardware. Since only one MMB is used, register one MMB node to monitor the MMB.
The MMB node registration procedure is as follows.

1. In the Systemwalker console window, select [Edit] from the functions that can be selected. The node list tree appears.

2. Select the network folder containing the MMB. Then, select [Object] - [Create Node] from the menu bar.
   If the network folder has not yet been created, create it before performing this operation.

3. For the node properties, enter the required items such as the display name and host name. For an operations management server (PRIMEQUEST 1000 series) running Linux, click [Basic Information] - [Add]. Then, select the MMB from the list. Also, click [Interface] - [Add] to register the physical IP address of the MMB.

4. The registered node appears as an MMB icon on the Systemwalker console.

For details on how to register the MMB nodes, see the *Systemwalker Centric Manager PRIMERGY/PRIMEQUEST Administration Guide*.

Remarks

- For an operations management server (PRIMERGY) whose operating system is Windows, the Solaris OS, or Linux, the MMB icon will not appear, though there is no problem with monitoring.
- When the MMB node has been registered through detection, the node icon may indicate a general computer, not the MMB.
  In this case, change the properties to change the machine type to MMB. Then, select [Policy] - [Distribute Policy]. In the [Distribute Policy] window, select [Apply Immediately]. Then, click the [OK] button.

J.2.2 SNMP trap linkage

This section provides an overview of SNMP trap linkage and describes the conversion definition procedure.

Process overview

Define conversion to convert SNMP traps from the PRIMEQUEST 1000 series server into messages that can be read and understood by the monitoring operator. Converted message text is displayed on the Systemwalker console.

Remarks

To ensure that converted text can be identified as a message from the PRIMEQUEST 1000 series server, the keyword [PRIMEQUEST] is embedded in the text.

Example: A SNMP trap from the PRIMEQUEST 1000 series server is converted and displayed.

```
[PRIMEQUEST] FileServer E 14002 SB#0-DIMM#0A0 DIMM: Uncorrectable \
ECC Part-no=0x0101 Serial-no=5023
```

The \ at the end of a line indicates that there is no line feed.

Note that to receive SNMP traps, the operations management server must be registered as the SNMP trap destination in the PRIMEQUEST 1000 series server.

For details on how to set an SNMP trap destination, see the following manuals:

- 7.5.2 Configuring SNMP in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN)
- 1.5.6 [SNMP Configuration] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN)

SNMP trap linkage procedure

1. Place the prepared TrapMSG conversion definition file, described in TABLE J.1 Files and tools to prepare, in a directory on the operations management server.

2. Execute the prepared SNMP trap conversion definition application command, described in TABLE J.1 Files and tools to prepare, to include the TrapMSG conversion definition file (see TABLE J.1 Files and tools to prepare) into Systemwalker (to run on the operations management server).
   Move to the command installation directory. Execute the following command.
   Example of execution on the operations management server (Linux):

   ```
   ./CNSetCnfMg.exe -f <TrapMSG conversion definition file name
   (full pathname)> -c
   ```

3. To represent the OID used in trap conversion as characters, use the MIB extended manipulation function of Systemwalker to register the prepared extended MIB file (for traps), described in TABLE J.1 Files and tools to prepare, in Systemwalker. (Use the Systemwalker console screen for the operations management client.)
   - For Systemwalker Centric Manager version earlier than V13.2
     1) Select [Operation] - [Operate Extended MIB] from the menu bar.
     2) Execute [MIB Registration]. At this time, specify the extended MIB file (for traps). (See TABLE J.1 Files and tools to prepare.)
   - For Systemwalker Centric Manager version V13.2 or later
     1) Select [Policy] - [Policy Definition] - [Monitor Node] - [Operate Extended MIB] from the menu bar.
     2) Execute [MIB Registration]. At this time, specify the extended MIB file (for traps). (See TABLE J.1 Files and tools to prepare.)

4. Apply the TrapMSG definition file to Systemwalker by performing the following step.

1) Move from the [Policy] menu to the [Distribute Policy] window. Select [Apply Immediately]. Then, click the [OK] button.

Remarks

- When the TestTrap function is used to confirm trap reception in the MMB Web-UI, the Test Trap message will appear on the Systemwalker console screen. In this case, the target MMB node enters the problem status on the console screen. Return it to the normal status by using the following procedure.
  1. Select the TestTrap message in the event display portion of the Systemwalker console screen.
  2. Select [Handle Monitor Event] from the right-click menu. Then, click [Handle].
  3. Confirm that the target MMB node on the Systemwalker console screen returned to the normal status.

- If modifying the filtering definition to output Info-level messages (Panic/Stop Error), see the following manual.
  Systemwalker manual: User's guide to the monitoring functions

To display the TestTrap message on the console screen, the event filtering definition described in J.2.3 Event monitoring linkage must be applied in advance.
For details on the TestTrap function, see the following manuals:

- 7.5.2 Configuring SNMP in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN)
- 1.5.6 [SNMP Configuration] menu in the *PRIMEQUEST 1000 Series Tool Reference* (C122-E110EN)

J.2.3 Event monitoring linkage

This section provides an overview of event monitoring linkage and describes its modification procedure.

Overview of event monitoring linkage

Event monitoring linkage enables the reporting of event alarms monitored and logged by PSA to the operations management server, in linkage with the Systemwalker agent. Only the event alarms recognized by Systemwalker (itself) are reported. An event filtering definition is simple to include. An event filtering definition provided for each model (Systemwalker template, see TABLE J.1 Files and tools to prepare). For details on how to include this template, see the Systemwalker manual.
To change part of a Systemwalker template definition, change the event monitoring criteria definition. The setting procedure is described below.
For details on message definition contents, see the Filtering Definition Manual that comes with the event filtering definition.

Modification procedure for event monitoring linkage

Use the following procedure to define filtering for event logs stored by the PRIMEQUEST 1000 series server.

1. In [Systemwalker Console], select the PRIMEQUEST 1000 series node to add a filtering definition to it.
2. Select [Policy] - [Distribute Policy] - [Event] - [Node ...] from the menu bar.
   The [Event Monitoring Criteria Definition] dialog box appears.

3. While the event to change is selected, select [Event] - [Update Event].
   The [Event Definition] dialog box appears.

4. Change the required items. Then, click the [OK] button to close the dialog box.

5. Distribute the event filtering definition to the changed PRIMEQUEST 1000 series server.
   Select [Policy] - [Distribute Policy] from the menu bar. In the [Distribute Policy] window, select [Apply Immediately]. Then, click the [OK] button.

J.2.4 GUI linkage

This section provides an overview of GUI linkage and describes the registration procedure.

Overview of GUI linkage

To permit access to the URL of the MMB login window of the PRIMEQUEST 1000 series from Systemwalker, register it from the [Operation] menu.
For a dual MMB configuration, configure GUI linkage for both of the MMB nodes.

GUI linkage procedure

1. Register the menu to start the PRIMEQUEST 1000 series MMB console. Open the command prompt on the operations management client. Execute the following command (see TABLE J.1 Files and tools to prepare) in any directory:

   ```
   mpaplreg.exe -a -m <menu name> -p <node name> -c <URL> -w
   ```

   <menu name>: Menu name displayed on the Systemwalker console
   <node name>: Node (host) name of the server to register (Usually, select the MMB node.)
   <URL>: URL starting with http:// for the top page of PRIMEQUEST 1000 series system management

2. Reboot the Systemwalker console.

3. After the reboot, confirm that the new menu was added to the [Operation] menu. Display the menu by right-clicking the specified node, and display the webpage with the specified URL.

Remarks

The above configuration must be complete for every registered PRIMEQUEST 1000 series server node.

J.2.5 Rack grouping function linkage

This section provides an overview of the rack grouping function linkage of Systemwalker and describes the procedure.

Overview of rack grouping function linkage

Systemwalker enables automatic grouping per rack by collecting the IP address of the management LAN of each partition node from the MMB node of the PRIMEQUEST 1000 series server. The management LAN must be configured in advance so that its IP address can be obtained from the MMB node.

Procedure for rack grouping function linkage

Log in to the operating system of each partition with Administrator privileges to configure the management LAN. For details on how to configure the management LAN, see the following manuals:

- For Linux: RHEL
  - 6.2.2 Confirming management LAN settings in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN)
- For Windows Server 2003
  - 6.3.1 Configuring the PSA-to-MMB communication LAN in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN)
- For Windows Server 2008
  - 6.4.1 Configuring the PSA-to-MMB communication LAN in the *PRIMEQUEST 1000 Series Installation Manual* (C122-E107EN)
- For Windows Server 2012
  - the *PRIMEQUEST 1000 Series ServerView Mission Critical Option User Manual*
  - Contact your sales representative for inquiries about this manual.

The PRIMEQUEST 1000 series rack grouping function automatically registers PRIMEQUEST nodes. For details on operation of this function, see the *Systemwalker Centric Manager PRIMERGY/PRIMEQUEST Administration Guide.*

J.2.6 Linkage with ServerView

In the PRIMEQUEST 1000 series server, ServerView Agent (SV Agent) is installed on each partition, and SVOM (ServerView Operation Manager) can handle configuration management and problem monitoring.
Systemwalker works together with ServerView to transmit the monitoring results from ServerView to the integrated management server of Systemwalker as well as start the ServerView console from Systemwalker. For details on the linkage procedure, see the *ServerView Operations Manager User's Guide*.

APPENDIX K How to Confirm Firmware of SAS Array Controller Card

This section explains how to confirm the firmware of SAS array controller card (including the one contained in the SAS array disk unit).

K.1 How to Confirm Firmware Version of WebBIOS 370
K.2 How to confirm with ServerView RAID 373

K.1 How to Confirm Firmware Version of WebBIOS

Use the following procedure to confirm the version of the firmware that is currently running.

Remarks

The screens in the following procedure are examples. The contents of the displayed screen such as a version number may be different from the contents of the actual screen.

1. From the menu screen, select [UEFI shell] to start the UEFI shell.

2. Execute the drivers command in the shell to confirm the driver numbers of UEFI and LSI EFI SAS Driver.

```
Shell> drivers
                T   D
D               Y C I
R               P F A
V  VERSION      E G G #D #C DRIVER NAME                          IMAGE NAME
== ========     = = = == == ================================== ==========
1E 0000000A     D - -  1  - PC-AT ISA Device Enumeration Driver IsaAcpi
42 00000000     ?- -  -  - PCI VGA Mini Port Driver            VgaMiniPort
43 0000000A     D - -  3  - Platform Console Management Driver  ConPlatformDxe
44 0000000A     D - -  2  - Platform Console Management Driver  ConPlatformDxe
45 0000000A     B - -  3  3 Console Splitter Driver             ConSplitterDxe
46 0000000A     ?- -  -  - Console Splitter Driver             ConSplitterDxe
47 0000000A     ?- -  -  - Console Splitter Driver             ConSplitterDxe
48 0000000A     B - -  2  2 Console Splitter Driver             ConSplitterDxe
49 0000000A     ?- -  -  - Console Splitter Driver             ConSplitterDxe
4C 0000000A     D - -  1  - UGA Console Driver                  GraphicsConsoleDxe
4D 0000000A     ?- -  -  - VGA Class Driver                    VgaClassDxe
6A 0413A000     B X X  1  2 LSI EFI SAS Driver                  ?
```

FIGURE K.1 drivers command in the UEFI shell

3. Execute the dh command to confirm the controller number of [LSI MegaRaid SAS Controller].
   In the following example, the controller number is [B4].

```
Shell> dh -d 6a
B6: Image(?) ImageDevPath
(../Pci(0x3,0x0)/Pci(0x0,0x0)/?)DriverBinding
Diagnostics Diagnostics2 ComponentName ComponentName2
Configuration Configuration2
  Driver Name     : LSI EFI SAS Driver
   Image Name      : ?
  Driver Version : 0413A000
  Driver Type     : BUS
  Configuration   : YES
  Diagnostics     : YES
  Managing    :
   Ctrl[B4] : LSI MegaRaid SAS Controller
    Child[13B] : Logical Channel
   Child[13E] : Physical Channel
```

FIGURE K.2 dh command in the UEFI shell

4. Execute the drvcfg -s XX YY command.
   Specify the following for [XX] and [YY].
   - XX: UEFI driver number confirmed in step 2
   - YY: Controller number confirmed in step 3

```
Shell> drvcfg -s 6A B4
```

5. In the menu displayed next, select [1].

```
Press 1 for EFI WebBIOS
      2 for EFI CLI
Or any other key to return :
```

6. The WebBIOS starts, and the [Adapter Selection] window appears.
   The list of the mounted array controllers is displayed. The [Type] column lists the array controller names. More than one array controller may be mounted at the same time.

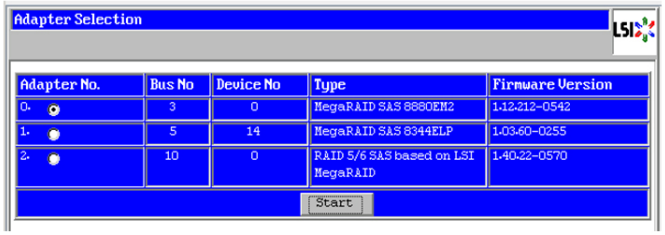

FIGURE K.3 [Adapter Selection] window in the WebBIOS (1)

7. Use the [Adapter No.] button to select the target array controller, and click the [Start] button.

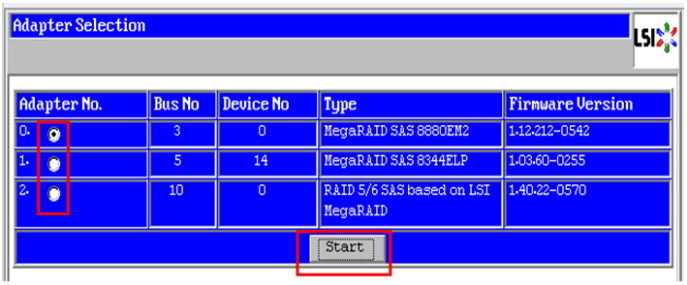

FIGURE K.4 [Adapter Selection] window in the WebBIOS (2)

8. The HOME window of WebBIOS appears.
   To confirm the version number of the firmware of the array controller, click [Controller Properties] or [Adapter Properties].
   In the following example window, [Controller Properties] is clicked.

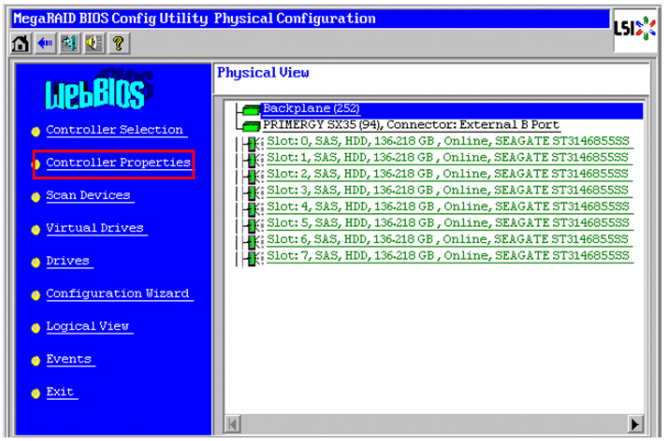
MegaRAID BIOS Config Utility Physical Configuration
WebBIOS
Controller Selection
Controller Properties
Scan Devices
Virtual Drives
Drives
Configuration Wizard
Logical View
Events
Exit
Physical View
Backplane (252)
PRIMERGY SX35 (94), Connector: External B Port
Slot: 0, SAS, HDD, 136.218 GB , Online, SEAGATE ST314685SS
Slot: 1, SAS, HDD, 136.218 GB , Online, SEAGATE ST314685SS
Slot: 2, SAS, HDD, 136.218 GB , Online, SEAGATE ST314685SS
Slot: 3, SAS, HDD, 136.218 GB , Online, SEAGATE ST314685SS
Slot: 4, SAS, HDD, 136.218 GB , Online, SEAGATE ST314685SS
Slot: 5, SAS, HDD, 136.218 GB , Online, SEAGATE ST314685SS
Slot: 6, SAS, HDD, 136.218 GB , Online, SEAGATE ST314685SS
Slot: 7, SAS, HDD, 136.218 GB , Online, SEAGATE ST314685SS

FIGURE K.5 Home window in the WebBIOS

9. The details of the array controller are displayed. Confirm the current firmware version number.
   [Firmware Version] or [FW Package Version] indicates the firmware version number.

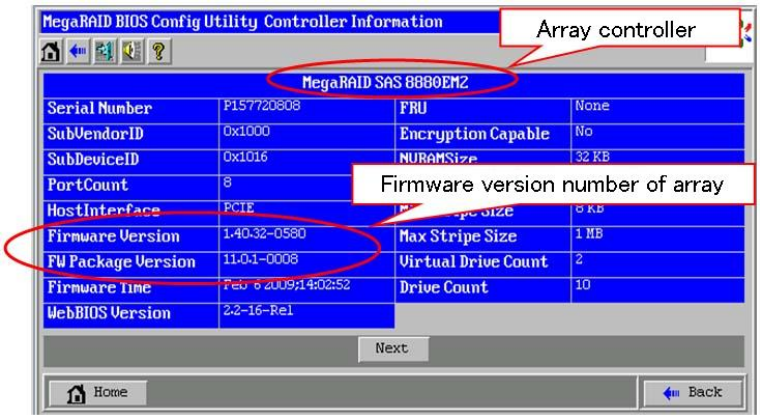

FIGURE K.6 [Controller Properties] window in the WebBIOS

Remarks

When the [Home] button is clicked, it returns to the HOME window.

10. When more than one MegaRAID SAS array controller is mounted at the same time, click [Controller Selection] or [Adapter Selection] in the HOME window.
    Then, return to step 7 to confirm the firmware version of other MegaRAID SAS array controller with the same steps.

K.2 How to confirm with ServerView RAID

This section explains how to confirm the version with ServerView RAID.

Remarks

The screens in the following procedure are examples. The contents of the displayed screen such as a version number may be different from the contents of the actual screen.

1. Start the system and log in to the OS.

2. Start the ServiewView RAID Manager, connect it to the target server, and log in.
   The account to be used for the login can be either administrator authority or user authority.

3. From the tree view, select the target array controller.

4. The firmware version number is displayed in the [General] tab in the object window (right pane in the window).
   The part to be referred varies with the used array being used. Check the part for the selected array controller.

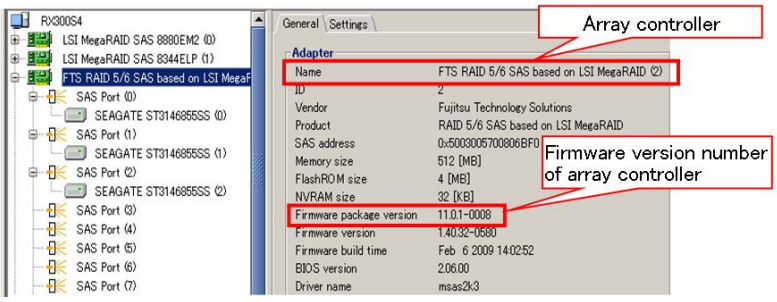

FIGURE K.7 [General] tab in the ServiewView RAID Manager

5. When more than one target MegaRAID SAS array controller is mounted at the same time, return to step 3.
   Use the same steps to confirm the firmware version number of other array controller.

APPENDIX L Software (Link)

For details on bundled software and drivers supplied with the PRIMEQUEST 1000 series hardware, see Chapter 3 Software Configuration in the *PRIMEQUEST 1000 Series General Description* (C122-B022EN).

APPENDIX M Failure Report Sheet

This appendix includes the failure report sheet. Use this sheet to report a failure.

M.1 Failure Report Sheet 377

M.1 Failure Report Sheet

Model name	□ PRIMEQUEST ( )
OS	□ Red Hat Enterprise Linux (Version:) □ Windows Sever (Version:) □ VMware (Version:)
Server installation environment	
LAN/WAN system configuration	
Hardware configuration	(Installed option types and locations)
Configuration information	(UEFI Setup Utility settings)
Occurrence date and time	Year Month Day Hour Minute
Frequency	□ Constantly □ Intermittently (times per) □ Unknown
Triggered by	Working before failure occurred? □ Yes □ No Current situation: Work details: Work affected? □ Yes □ No
Symptom	□ Hanging □ Slowdown □ Reboot □ OS panic/stop □ OS startup not possible □ Communication unavailable □ Other ( )
Error message	System event log: Agent log/Driver log: OS message: Other:
Status of various lamps	
Supplementary information	□ Yes □ No

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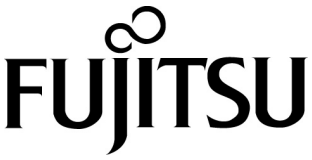
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